THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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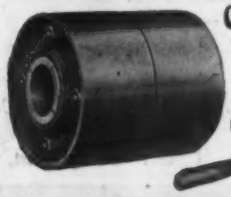

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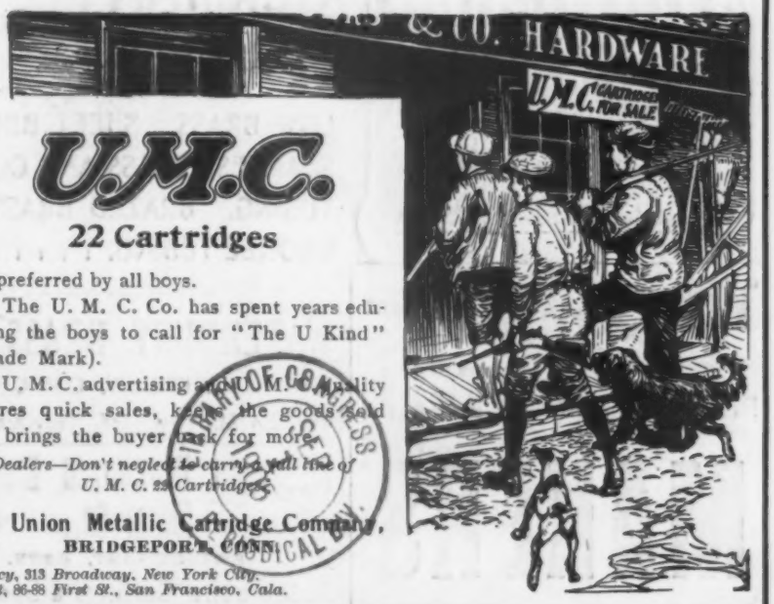

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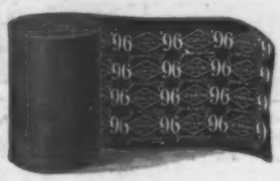

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'THE IRON AGE

New York, Thursday, August 31, 1905.

Power Plant of the Boston and Worcester Street Railway.

The Boston & Worcester Street Railway Company operates an electric interurban system about 40 miles long, connecting Boston and Worcester, Mass. The power plant is located at Framingham, about half way between the two terminals, and was completed and first put into operation in the winter of 1902. Substations are located at Westboro, which is 11½ miles from the power plant; at Marlboro, a little over 8 miles from the plant, and at Wellesley Hills, nearly 10 miles from the plant. Other lines purchase power from this plant and it is expected that later the Waltham Street Railway will be supplied with power by a line from the Wellesley Hills substation, 7½ miles distant.

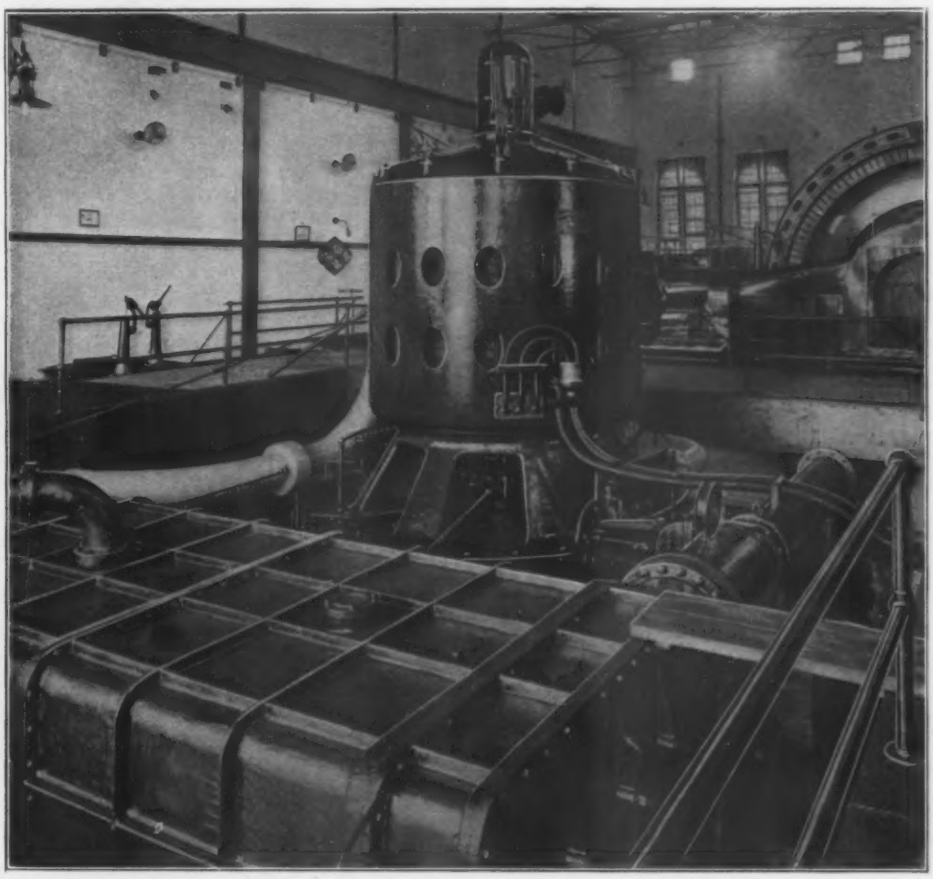


Fig. 1.—A View of the New 2000-Kw. Curtis Steam Turbine and Its Alberger Surface Condenser.

Recent extensions of the power plant equipment have departed somewhat from the original intention. Instead of an additional engine a Curtis steam turbine of 2000 kw. capacity has been installed, shown in Fig. 1, and in connection with it an interesting plant for cooling the condensing water, which is probably the largest ever erected in the East. To enable the best understanding of the conditions affecting the latest work it will be well to consider the plant in its entirety, and for that reason the accompanying plan, Fig. 2, shows it as it exists to-day.

Beside the station runs the Sudbury River, from which a supply of good water is available for boiler feeding and condensing that is sufficient when used economically. To cover the worst emergencies a supply from the town service mains is provided. The river varies considerably in depth at different seasons of the year, and on account of other water users beyond only a certain amount is allowed to this plant. In times of drought the limit is about 1,500,000 gallons per 24 hours for all purposes. Estimates showed that over four times that amount would be required when the station was running on even a normal load, and for this reason it was decided to install cooling towers so that most of the water might be used over and over repeatedly when it was scarce, the evaporation being compensated for by supplying a quantity of cool water from a well in the rear of the station.

The building is of red brick, with granite trimmings, and is 182 feet 8 inches long by 105 feet 4 inches. The stack is of brick to match the building, is 185 feet high and has an internal diameter of 8 feet. The frame of the building is very heavy and required the use of some 150 tons of steel, which was furnished by the American Bridge Company. This includes all of the roof trusses and the frame of the engine room floor.

The building is divided by a main wall into a boiler room and an engine room, beneath which is a basement. The basement might be regarded as the first floor, as it is on a level with the yard. It is 12 feet high and contains the heaters, condensers, all large piping connecting the engines with the boiler room piping and the air chambers under the transformers. In the engine room beyond there is no overhead piping except the supply

to the turbine. In the rear of the engines there is an open well through which the apparatus in the basement beneath may be observed without going down stairs. The engine room is served by a 25-ton electric traveling crane, furnished by the Whiting Foundry Equipment Company, Harvey, Ill.

The boiler room originally contained two batteries of Aultman & Taylor boilers of a total capacity of 1500 horse-power, to which there has lately been added another battery of 1300 horse-power. The steam main at the rear of the boilers is 16 inches in diameter and rests upon heavy adjustable roller brackets about 3 feet from the floor, so that the large valves are easily accessible. A 6-inch auxiliary main over this one supplies the steam for all of the pumps. All branches from the boilers to the steam main are mild steel, with long turn bends to allow for expansion. The Chapman Valve Mfg. Company furnished all of the gate valves, and the globe valves are of Pratt & Cady make.

A Green economizer is located between the old and new boilers, and, with the additions recently made to it, now contains a total heating surface of 9212 square feet. Directly beneath the economizer are located two feed pumps, an auxiliary feed pump and an auxiliary heater. The main smoke flue is arranged to pass the hot gases normally through the economizer or, if necessary, through a by-pass directly into the chimney. The feed water can be sent through or around the economizer or direct from the pumps to the boilers, and the exhaust from the engines may be passed by the heaters. Coal is received over a spur from the tracks of the New York, New Haven & Hartford Railroad leading to the coal bins, which are behind the boiler room and have a capacity of 1000 tons. From the bins the coal is fed by gravity directly in front of the boiler room doors.

The original generating units were two Rice-Sargent horizontal compound condensing engines, which may be seen in Fig. 3. One is a 24 and 48 x 48 inch engine, rated at 1500 to 2500 horse-power, supplied with steam at 150 pounds pressure and direct connected to a General Electric 1000-kw. 28-pole three-phase 13,200-volt alternator of the fly wheel type running at 107 revolutions per minute. The other unit is a 20 and 40 x 42 inch engine, rated at 800 to 1500 horse-power, and drives at 107 revolutions per minute a General Electric 28-pole 500-kw. 13,200-volt alternator. The revolving fields of the generators take the place of fly wheels, which allows the two engines of each set to be placed very close together and economizes floor space. The speed of the engines is regulated by high speed governors in connection with Corliss valve gearing. They are capable of maintaining constant speed from no load to full load, and a sudden fluctuation in load will never cause a variation in speed exceeding 3 per cent. Provision is made for adjusting the governors to vary the speed of the engines while running to make it possible to synchronize the two alternators. One of the condensers for the reciprocating engines is of Deane make and the other Knowles. They take the injection water from the river by way of a well connected with the river by a canal, with a screen and gate

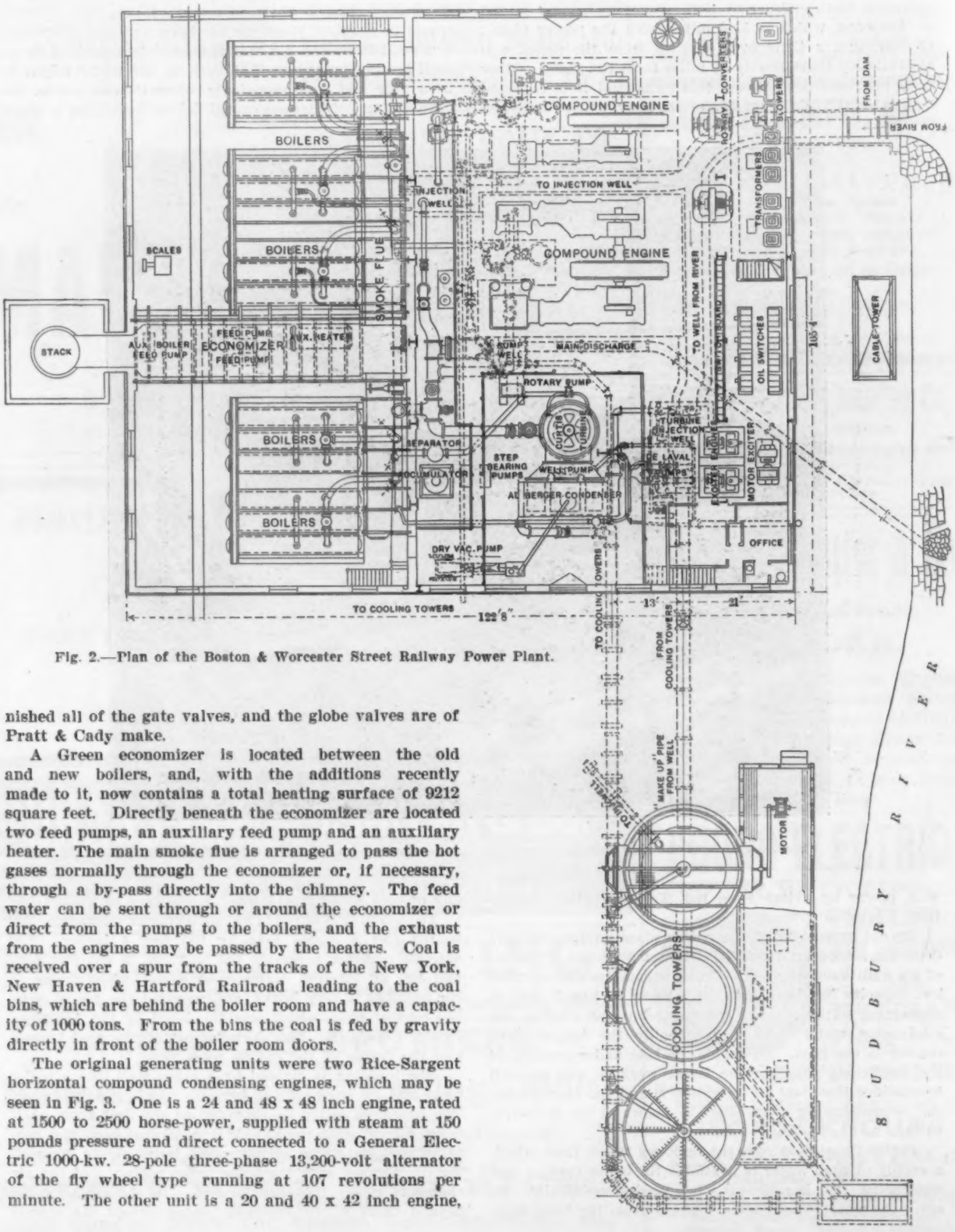


Fig. 2.—Plan of the Boston & Worcester Street Railway Power Plant.

at the mouth. A dam situated some 500 feet up stream from the power station diverts the water through a 36-inch pipe leading directly into the canal, and at times of low water a head of 2 feet may be obtained.

The new generating set is a Curtis vertical steam turbine connected with a 2000-kw. 13,200-volt General Electric alternator. The turbine exhausts into an Alberger counter-current surface condenser containing 12,000 square feet of effective cooling surface. The requirements of the condensing equipment were rather exacting, and the guarantee made by the Alberger Condenser Company for the condenser and dry vacuum pump is noteworthy. It stated that the equipment would be capable in ordinary midsummer weather, when the outside temperature is approximately 80 degrees, of condensing a maximum of 60,000 pounds of exhaust steam per hour and of maintaining a vacuum between 26½ and 27 inches when the barometer stands at 30 inches, and of condensing a total of 40,000 pounds of steam per hour under the same conditions, and maintaining a vacuum of 27 to 27½ inches. In connection with the condenser there is installed an 8 x 18 x 24 inch Alberger dry vacuum pump. Water of condensation is removed from the bottom of the condenser by a 5¾ x 6¾ x 8 inch horizontal duplex hot well pump and is delivered into an adjacent tank for boiler feed. The cooling water for the condensers is circulated by two De Laval steam turbine driven rotary pumps, one of 55 and the other of 110 horse-power. These deliver the circulating water against a pressure corresponding to a head of 45 feet. The smaller set was guaranteed to handle 3400 gallons per minute at a speed of 1500 revolutions, with steam at 150 pounds pressure and 27½ inches vacuum, while consuming not over 22½ pounds of steam per horse-power per hour, and to show an efficiency of 69 per cent. The larger set under the same conditions was guaranteed to deliver 6700 gallons per minute, using 18.4 pounds of steam per horse-power per hour.

The condensed steam is cooled in Alberger cooling towers, which have been erected near the power house, close to the bank of the river, as shown in Fig. 4. These cooling towers are three in number, each 22 feet in diameter by 35 feet high. Each tower is capable of taking care of all of the circulating water from the condenser of a 1000-kw. cross compound engine using 15 pounds of steam per horse-power per hour and capable of 50 per cent. overload, taking the water at a temperature of not lower than 10 degrees below that of steam at 26 inches vacuum, removing from the water the same number of heat units as it absorbs in condensing the steam. The two fans in each cooling tower are driven at 300 revolutions per minute by belt from a 40 horse-power motor. It was required that the water added to the circulating systems by the condensation of steam should be more than enough to make up for the loss due to evaporation and that no additional water should be needed other than sufficient to feed the boilers. Two of the towers will cool all of the circulating water from the turbine condenser when passing 40,000 pounds of steam per hour, or that calculated to correspond to the demand at normal load. The three towers together are sufficient to cool the circulating water when the turbine is carrying a 50 per cent. overload, or using about 60,000 pounds of steam per hour.

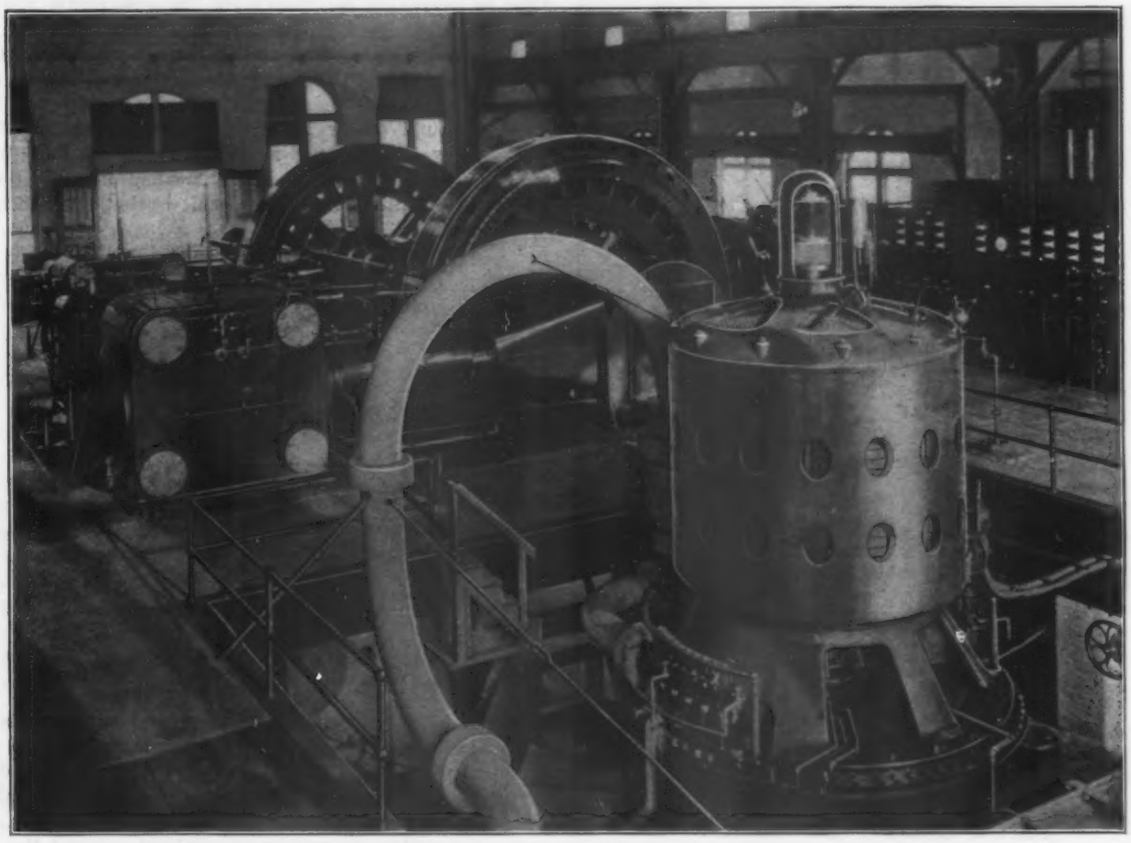


Fig. 3.—A View in the Engine Room, Showing the Original Installation of Reciprocating Engines in the Background.

The exciters for all of the generators comprise two steam driven sets and one motor driven set. The steam driven sets stand near the Curtis turbine, with the De Laval turbine driven pumps between. They consist of General Electric six-pole 35-kw. 125-volt direct current generators direct connected to General Electric single cylinder marine type engines running at 305 revolutions per minute. The other is a motor driven General Electric exciter, consisting of a four-pole 50-kw. 125-volt direct current generator direct connected to a four-pole 75 horse-power 350-volt induction motor, and runs at a speed of 150 revolutions per minute. Oiling of all the moving machinery is automatically accomplished by a system of compressed air.

The current is transmitted to the substations at the generated pressure, 13,200 volts. For the local trolley lines it is reduced at the station to 370 volts in six 100-kw. General Electric air cooled step-down transformers, and is converted through two three-phase six-pole 250-kw. 25-cycle rotary converters into direct cur-

rent at 600 volts. The transformers communicate with chambers below, through which a blast of air is blown by two blowers located near them. A 75-kw. three-phase air cooled step-down transformer reduces the current for driving the induction motor on the motor driven exciter.

The power station is one of the largest plants in New England. The contractors for the building were J. M. Bishop & Co., Worcester, Mass. The power plant, substations and car houses were designed by and built under the supervision of E. H. Kitfield, consulting engineer. The construction of the entire line has been carried forward under the immediate supervision of James F. Shaw & Co., Boston, Mass., who are similarly interested in the building of other lines.

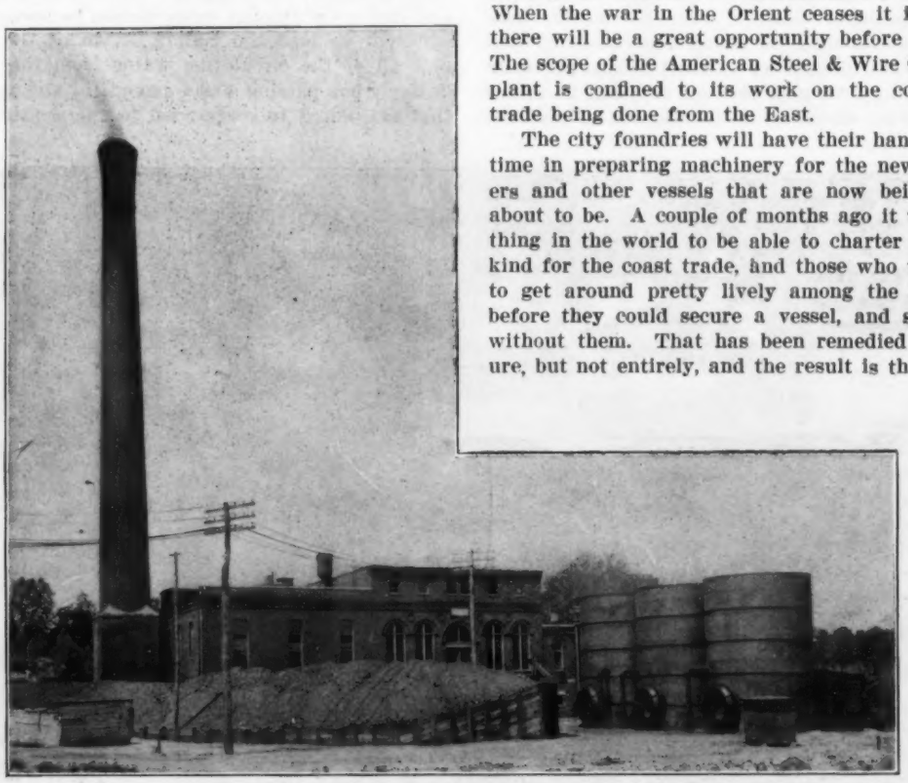


Fig. 4.—Exterior View of the Plant, Showing the Alberger Cooling Towers.

Pacific Coast Trade Topics.

SAN FRANCISCO, CAL., August 19, 1905.—The date for the inauguration of the great scheme of competition between the Pacific Mail and the multitude of steamers from all ports of the world to divide up with it the transportation between Panama and San Francisco has long gone by, but still there is no sign of the promised fleet. Matters are going on much as usual and the steamers of the Pacific Mail have continued to render the usual services in the usual way. Of course no one can tell what the future may bring forth, but between the large steamers of the Hawaiian American Steamship Company and those of the Pacific Mail there does not seem to be much chance for the intrusion of outside vessels. This just suits the importing merchants and it is more than doubtful if a newcomer would be able to secure any patronage worth while. The tonnage this year westward is greater than ever, but there does not appear to be any increase in that carried over the Isthmus. As a matter of fact the big steamers that ply around the Horn take the heavy goods that have time enough for the trade after a 50 or 60 days' voyage. The others come over the Isthmus and the perishable goods and the rush orders by rail.

The grain crops are now gathered in and the result is as foreshadowed, a light wheat crop and a pretty good barley crop. Oats are light, but the hay crop is the best in quality and quantity for years. This helps materially to make up for the shortage in wheat, so that the actual business which will come in the fall does not seem to be affected by the grain shortage. Indeed, imports by rail and sea of hardware, iron and steel, pipe, structural iron and steel, wire, &c., are large, and with the exception of the latter larger than ever, notwithstanding that there is some competition by home industries. The manufacture of pipe—sheet iron pipe—is very large here and the shipments to the Islands particularly are unusually heavy. The business of the Pacific Steel & Wire Company has been better than ever this year and Manager Frank L. Brown is continually opening up new fields of usefulness for the corporation. When the war in the Orient ceases it is expected that there will be a great opportunity before this institution. The scope of the American Steel & Wire Company's local plant is confined to its work on the coast, the export trade being done from the East.

The city foundries will have their hands full for some time in preparing machinery for the new steam schooners and other vessels that are now being built or are about to be. A couple of months ago it was the hardest thing in the world to be able to charter a vessel of any kind for the coast trade, and those who wanted one had to get around pretty lively among the shipping offices before they could secure a vessel, and some had to do without them. That has been remedied in some measure, but not entirely, and the result is that several firms which have to make use of steam and sail vessels in transportation of lumber, &c., have started out to get vessels built themselves. These will want a good deal of machinery during the next few months, and taken in connection with the regular demand from mines, oil wells, &c., will make matters more lively among the big foundries of the city, particularly as that work is confined to San Francisco. J. O. L.

The American Floating Exposition is the name which has been adopted for an enterprise designed to extend American trade abroad, to be conducted under the management of the Export Shipping Company, 9 and 11 Broadway, New York. The announcement received from this company states that in January, 1906, a steamship will be dispatched on a voyage around the world. The trip will embrace points in Europe, Asia, Australia, South America, Central America and the West Indies, touching at about 75 ports in 46 different countries and consuming about fifteen months' time. A limited number of samples of merchandise of American manufacture will be accepted on this vessel. The samples are to be arranged so as to be readily accessible for display at each of the ports, where a stop will be made of several days for the purpose of permitting an examination by merchants and others interested in American products. The statement is made that the company's agents in various countries will be notified of the time of the steamship's visit and invitations will be extended to desirable persons to inspect the display. Accommodations will be provided for representatives of manufacturers to accompany their samples. Circulars issued by the company give regulations governing the use of space and terms upon which manufacturers can secure representation.

Operating a Charcoal Furnace on 100 Per Cent. Concentrates *

BY HARRY R. HALL, STANDISH, N. Y.

Making pig iron from magnetic concentrates and cobbed ore with charcoal varying from 12 to 20 pounds to the bushel is on the face of it not inviting. The charcoal was made of hemlock, pine, spruce, balsam, maple, beech and birch woods. The concentrates would all pass a ⅛-inch screen and about 34 per cent. would pass an 80-mesh sieve. The cobbed ore would pass through a 1-inch ring and about 25 per cent. would pass a ⅛-inch screen. The concentrates contained from 62 to 65 per cent. iron, while the cobbed ore varied from 32 to 47 per cent. of metallic iron and from 23 to 32 per cent. of silica.

The furnace was blown in on October 20, 1903, on wet charcoal, which was supposed to weigh when dry 18 pounds to the bushel. Some charcoal similar to this was stored in the stockhouse for about a year and was then found to weigh 12 pounds per bushel. During the first 10 days of the blast the furnace produced 362 gross tons of pig iron, using 200 bushels of charcoal per ton of iron. From November 1 to 12 the volume of wind blown was increased gradually from 2808 cubic feet per minute to 5400 cubic feet, with practically no increase of output. Silicon in the iron averaged 0.75 per cent, with sulphurs about 0.035 per cent. We now began to get some freshly burned dry charcoal. The silicons in the iron increased, the sulphurs dropped below 0.010 per cent., and on the 18th of the month the furnace made 77½ tons of No. 2 pig iron, which was the maximum output for the month. For the next 12 days the output varied from 19 to 72 tons per day, the amount being apparently dependent upon whether wet or dry coal was used and independent of the volume of wind. For the last 10 days of the month we had the advantage of the experience of a blast furnaceman who had used considerable charcoal. He suggested we try short tuyeres, a smaller bell (our bell was 5 feet in diameter, with stock line 7½ feet), and condemned bosh cooling plates. We tried shorter tuyeres, but got no better results. We did not try a smaller bell nor was the bosh construction changed. The output for the month was 1261 tons on a fuel consumption of 175 bushels of charcoal.

Working Up to 100 Per Cent. of Concentrates.

Soon after December 1 we quit using wet charcoal and the furnace output was decidedly more regular. For the month we blew an average of 38 revolutions, practically 6000 cubic feet per minute. The minimum was 36.6 revolutions and the maximum 43.6 revolutions, which is the most wind ever blown on this furnace, as the loss of ore was excessive. The lowest day's output was 66 tons and the maximum output 113 tons. The output for the month was 2777 tons on a fuel consumption of 114 17-pound bushels. During the month the fuel charge was increased from 72 to 96 bushels, then to 120 bushels, then back to 96 bushels, as the latter gave more even distribution on the bell. Some months later we again tried a 72-bushel charge with no change in the working of the furnace. During the month the ore burden varied 30 per cent., depending upon the weight of coal per bushel. All coal was bought by measured bushel; consequently the same weight of coal could not easily be delivered to the furnace for each charge, as the coal was measured in the furnace filling barrow.

During the month we used an average of 15 per cent. of cobbed ore and 85 per cent. of concentrates. Starting with 66 2-3 per cent. of concentrates, we gradually worked the percentage up to 90, with no ill results to the furnace. It was then that I figuratively held my breath for 12 hours while 100 per cent. of concentrates was charged. Then 10 per cent. of cobbed ore was put on again. The furnace was more inclined to hang up, turned a shade cold and the slag was not quite of the right composition. Later we again used 100 per cent. of concentrates for 12 hours, then resumed the old fill. This time the furnace made the kind of iron we wanted. After this we used 100 per cent. of concentrates for five months, using 1.6 tons of concentrates, the equivalent of 89 20-pound bushels of charcoal and 1-10 ton of limestone per ton of pig iron, with an average output of 89 tons per day for the period. During this time 6 per cent. of the ore burden was carried away by the gas. A sieve test of the dust catcher ore was as follows:

All passed a 20-mesh sieve.
Two and one-half per cent. remained on a 40-mesh sieve.
Ten per cent. remained on a 60-mesh sieve.
Thirty-four per cent. remained on an 80-mesh sieve.
Twenty per cent. remained on a 100-mesh sieve.
Thirty-three and one-half per cent. passed a 100-mesh sieve.

A sieve test of the concentrates charged into the furnace was as follows:

All passed a ⅛-inch sieve.
Twenty-four per cent. remained on a 20-mesh sieve.
Thirty-one per cent. remained on a 40-mesh sieve.
Eleven per cent. remained on a 60-mesh sieve.
Nine per cent. remained on an 80-mesh sieve.
Six per cent. remained on a 100-mesh sieve.
Nineteen per cent. passed a 100-mesh sieve.

On charcoal we generally blew 5625 cubic feet of air per minute (Southwark engine displacement). In April we used 40.3 cubic feet of air to burn 1 pound of charcoal. In May we used 43 cubic feet per pound of fuel. In June we used 44 cubic feet per pound of fuel.

Experience with Coke.

The same furnace using coke produced 60 tons per day for a month on a fuel consumption of 2220 pounds of Connellsville coke. Blowing the same volume of wind on coke as was blown on charcoal the loss of ore burden by being carried away by the gas was 25 per cent. Increasing the volume of air would not increase the output, as more ore was carried away by the gas. Volatile matter in the charcoal formed a coating on the dust catcher dirt, making it impossible to wet it, but when using coke we wet the dirt and charged it back into the furnace. If the dust catcher dirt was put into the furnace without wetting it it was immediately carried back into the dust catcher by the gas.

On charcoal the average pressure from month to month varied from 4¼ to 5 pounds. The pressure was apparently dependent upon the weight of coal per bushel, being higher on heavy coal. The blast pressure on good coke was lower than when blowing the same volume of wind on charcoal. The maximum daily output of the furnace on charcoal was 113 tons and the maximum on coke was 73 tons. The furnace would have made more iron had the ore been coarser. Hard blowing increased the loss of concentrates, due to the resultant dust, and the facilities for making charcoal were limited.

Charcoal Ranks First as Fuel.

The impression seems to be broadcast that coke is the ideal fuel, while the fact is charcoal ranks first because of its low ash contents and practically no sulphur. For instance, take one month's work on charcoal, using 1751 pounds of fuel and 157 pounds of stone per ton of iron, and compare it with the fuel consumption of 2220 pounds of Connellsville coke. Of charcoal 75 per cent. is fixed carbon. Using 157 pounds of limestone will consume about 30 pounds of charcoal per ton of iron. This leaves 1283 pounds of carbon for reducing the ore, melting iron, radiation, &c.

In the case of coke we used 1330 pounds of stone (coke was high in sulphur), which required about 240 pounds of coke. This leaves 1647 pounds of carbon available to reduce ore, &c. These figures are approximately accurate, and serve as a rough estimate to show that a charcoal furnace of the same size as a coke furnace will produce from one-quarter to one-third more pig iron per unit of time. On charcoal:

A 7-foot hearth should produce 110 tons pig iron per day.
A 7½-foot hearth should produce 133 tons pig iron per day.
An 8-foot hearth should produce 161 tons pig iron per day.
An 8½-foot hearth should produce 192 tons pig iron per day.
A 9-foot hearth should produce 225 tons pig iron per day.

To get the above outputs the furnace must have proper lines and the equipment must be first class and well balanced. The ore should carry over 60 per cent. of metallic iron and must not contain large lumps or very fine dust and should contain three times as much silica as alumina.

* Abstract of a paper prepared for the American Institute of Mining Engineers.

An Acetylene Blow Pipe for Welding.

A description is given by the London *Engineer* of the Fouche acetylene blow pipe for the autogenous welding of iron and steel: A special feature of this blow pipe is that the acetylene is fed to it under a pressure of but 5 inches or 6 inches of water; thus all the dangers and difficulties which arise when it is attempted to store the gas under pressure are avoided. The oxygen, on the other hand, is supplied at a pressure of one atmosphere through a reducing valve of the usual type mounted on an ordinary gas cylinder. A water seal is interpolated in the acetylene main so that the oxygen can under no conditions pass back into the generator by this pipe. The blow pipes are made in the number of standard sizes, the smallest of which takes 75 liters (2.7 cubic feet) of C^2H^2 and 100 liters (3.5 cubic feet) of oxygen per hour and is suitable for the autogenous welding of plates 1 mm. thick. The largest size, on the other hand, with which plates as much as 20 mm. (0.8 inch) thick can be readily welded consumes 2200 liters (78 cubic feet) of C^2H^2 per hour and 3000 liters of oxygen. The supply of oxygen is regulated so as to insure that the flame is of the "reducing" type, so that there is no possibility of the metal at the weld being injured by oxidation.

In some experiments made in France a 6-inch cylinder of ½-inch metal was welded by means of the blow pipe, which is used just as the ordinary oxyhydrogen blow pipe is in the "burning" of lead. This cylinder was afterward tested to 150 atmospheres without failure. The flame is much smaller than the oxyhydrogen flame, but also much hotter, the temperature attained at the top of the inner cone being about 5400 degrees F. If it were not for the necessity of keeping down the supply of oxygen so as to render the flame "reducing" a still higher temperature would be reached, possibly attaining 7200 degrees F. Acetylene being an endothermic compound, the heat available on the blow pipe is not that due merely to the combustion of its constituents, but includes also the large number of heat units liberated on the decomposition of the gas. A cubic foot of this gas is therefore capable of furnishing 1500 British thermal units, as compared with about 350 units in the case of H and 600 units per foot in the case of ordinary coal gas. The blow pipes used are said to be free from any tendency to choke up with carbon, remaining clean for an indefinite period. The apparatus is being used on a large scale in different Continental manufacturing establishments, being found to be cheaper in working than the oxyhydrogen apparatus it replaces.

The Keep Sectional Cupola.

A small cupola, if it were not for the difficulty in cleaning and repairing the lining, would be a very great convenience in emergencies. The cupola designed by W. J. Keep and built by the Northern Engineering Works, Detroit, Mich., is made in sections 18 inches long and 28 inches outside diameter. These are lined with ordinary stock bricks laid flat, the edges being beveled so that the bricks may be keyed in. The bricks become well cemented together after the first heat. The complete lining is 3 inches thick, making the inside diameter 22 inches. A ring of 1½-inch angle iron is riveted to both ends of each section for stiffness to hold the bricks in place and to afford a joint between sections. In assembling the sections it is preferable to daub the joints with clay from the inside. The sections simply sit on one another, but often it is necessary to start them apart after a heat with a chisel. The lower section contains a wind box and six tuyeres 4½ inches square on the inside. This section is set on a solid bed plate on wheels so that the cupola can be rolled anywhere required. The sections can be handled by a light jib crane or by a trolley placed a little to one side of the stack and provided with an ordinary

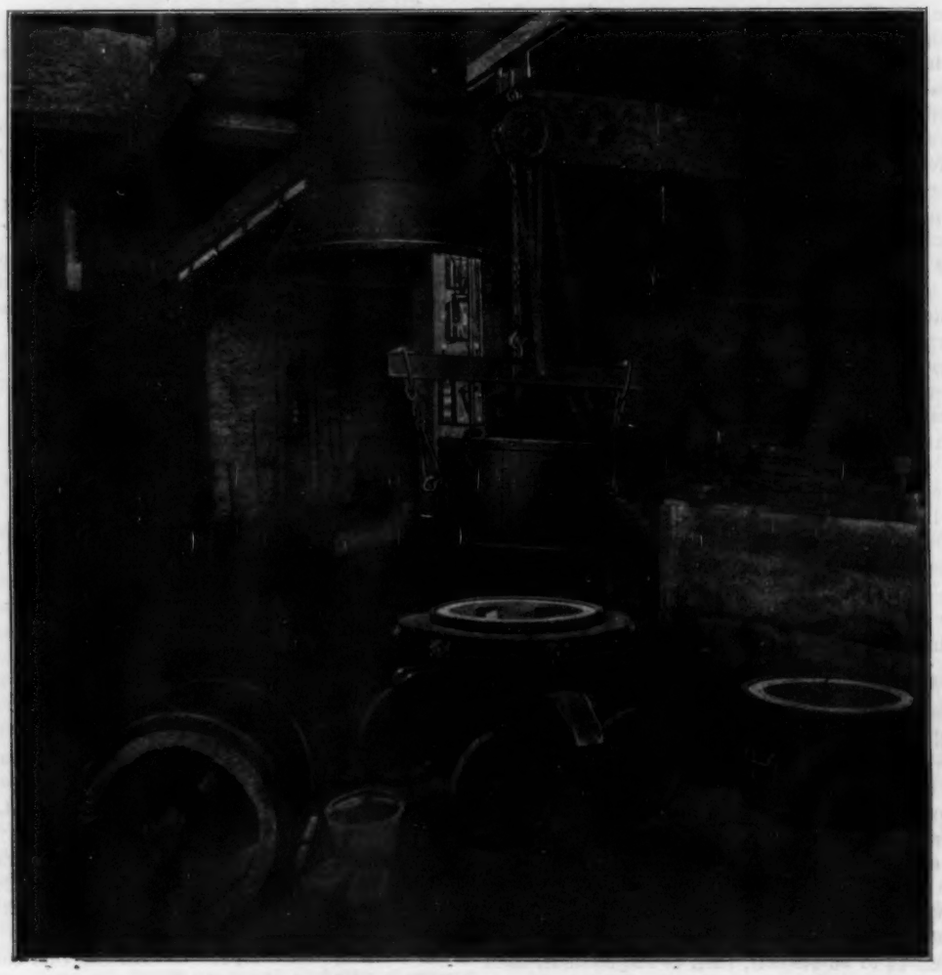


Fig. 1.—Preparing the Keep Sectional Cupola for Use.

chain hoist. The melting zone of the cupola is in the section above the tuyere section. When burned out a better section may be substituted and the burned section used higher up.

The stack is suspended by rods from the foundry roof, is 24 inches in diameter and flares at the lower end to 26 inches. The lower end is 7½ feet from the floor and is just high enough for the cupola to roll under it. One side of the flaring portion is cut away for a charging door. The 3-inch opening between the top of the cupola and the edge of the stack creates a strong draft and keeps the air fresh around the cupola.

The accompanying half-tones, Figs. 1 and 2, give two views of the cupola, the first showing it being prepared for the taking of a heat and the second showing it in use. Fig. 3 shows a side and a front elevation of the cupola with all of the auxiliary parts of the equipment, and Fig. 4 shows top and side views of a single section.

Preparatory to taking off a heat the bed plate is rolled

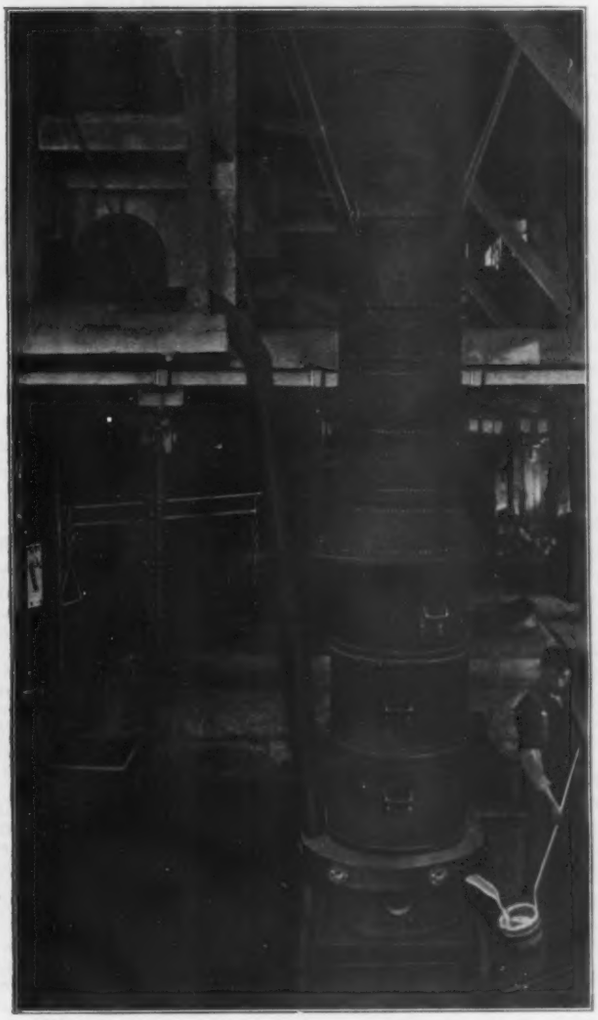


Fig. 2.—The Cupola in Operation.

under the trolley track and the lower section is put in place, as shown in Fig. 1. A sand bottom is put in 2½ inches thick at the front and 3½ inches at the back. The spout is then lined and the breast put in, a slag hole being left at the rear. In this section shavings and kindlings are laid, and the other three sections are placed in position, the joints being daubed on the inside. The cupola is then rolled under the stack and the pipe put in position connecting the blower and the wind box. This pipe is an ordinary 6-inch stove pipe and fits on a collar on the wind box; a little daubing with clay prevents leakage. A temporary charging platform is constructed of boxes or flasks and a charge of about 100 pounds of coke is dumped in. The fire is then lighted and allowed to burn about two hours before it is intended to draw any iron. When this is well lighted about 60 pounds of coke and 200 pounds of iron are charged, and then 30 pounds of coke and 200 pounds of iron, and so on. The cupola holds four charges, which can be put in in 15 minutes. Pig iron and scrap should be broken into pieces about 10 inches long and

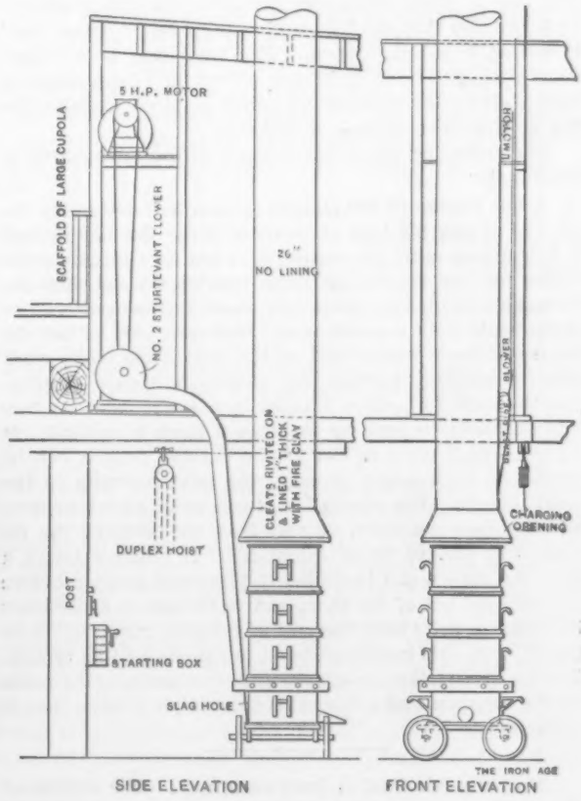


Fig. 3.—Two Elevations of the Cupola and Its Auxiliary Equipment.

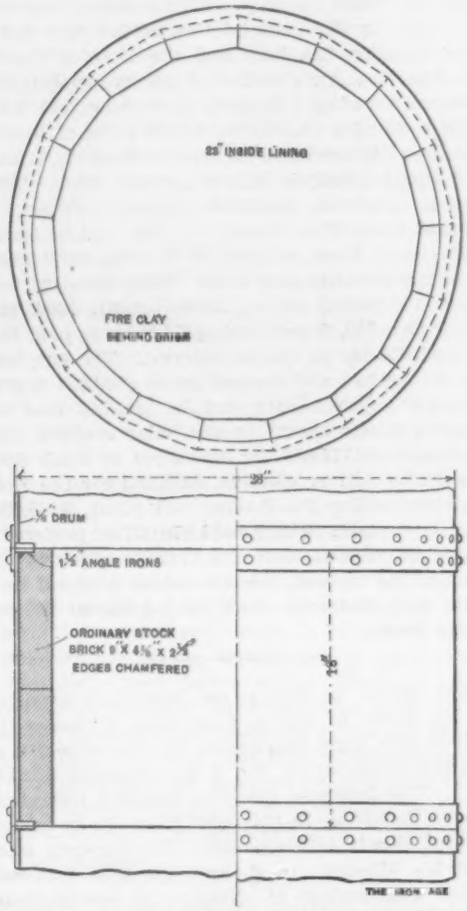


Fig. 4.—Details of One of the Sections of a Keep Cupola.

charged evenly. To hurry the fire in lighting the wind pipe from the blower may be connected to the slag hole before it is connected to the wind box. The blast should

be put on the tuyeres 15 minutes before iron is wanted. The cupola will melt 2000 pounds of iron per hour and 18 charges, or 3600 pounds, can be melted at one heat. Two or three heats may be made in the same day. It is best to begin to remove slag after the eighth charge. It is claimed that the iron will be as good or better than if melted in a large cupola. The blast may be obtained from a No. 2 Sturtevant blower driven by a 5 horse-power motor, about 4½ horse-power being required to drive the fan at 1500 revolutions per minute.

The following are given as some of the advantages of the cupola:

A test charge of 100 pounds of iron will determine the quality of any pig iron or mixture if the fire has burned two hours or until the cupola is as hot as a large cupola. When for any reason the large cupolas are not run the foreman and his assistants may mold and take off two or three heats with a small cupola and earn part, if not the whole, of their wages, and at the same time make work that is needed. During any shutdown repair castings can be made for orders wanted in a hurry and the iron will be ready to pour by the time a piece is molded. If an important piece is lost at the regular heat it can be made the same night or early the next morning in the small cupola. For special mixtures such as white iron, chilling iron, semisteel or soft iron for patterns the results will always be as calculated. If molders break a heat the cupola can be rolled in place and started before the men get out of the shop, and work that is needed can be made, so as to keep the rest of the shop running. As a result, with this cupola on hand few heats will be broken. In case of a strike enough castings can probably be made by the foreman and a few others to complete work that is under way.

The Bon Air Coal & Iron Company.—The statement of the Bon Air Coal & Iron Company, Nashville, Tenn., for the fiscal year ending December 31, 1904, as presented at the annual meeting at Augusta, Maine, March 14, 1905, has been published recently. The company was formed July 1, 1902, by the consolidation of the Bon Air Coal, Land & Lumber Company and the Buffalo Iron Company. The Bon Air division of the properties consists of 40,000 acres of coal lands in Tennessee and the Buffalo River division consists of 80,000 acres of brown ore lands. There is one blast furnace at Warner, Tenn., and two at Allen's Creek, in Wayne County, Tenn. The latter are in operation, producing Mannie softener. Coke is obtained from Wise County, Va., but will be furnished from Eastland, Tenn., as soon as the company's own coke plant of 200 ovens is completed. The statement for two and one-half years, ending December 31, 1904, showed profits of $392,712, from which $277,103 was paid in dividends and $53,840 in coupon interest. The surplus was $6542. In the two and one-half years $509,924 was spent on furnace improvements and in opening coal mines. Among the assets shown on the balance sheet, totaling $4,790,614, is $2,775,356 for 120 acres of land, $860,909 for the Buffalo River division, $418,283 for the Bon Air plant, $169,014 for the Ravenscroft plant, $188,255 for the Eastland plant. There is $1,876,057 of preferred and $1,876,058 of common stock and $747,833 of bonds. There remains in the treasury for extensions $623,942 each of common and preferred stock and $184,000 of general mortgage bonds.

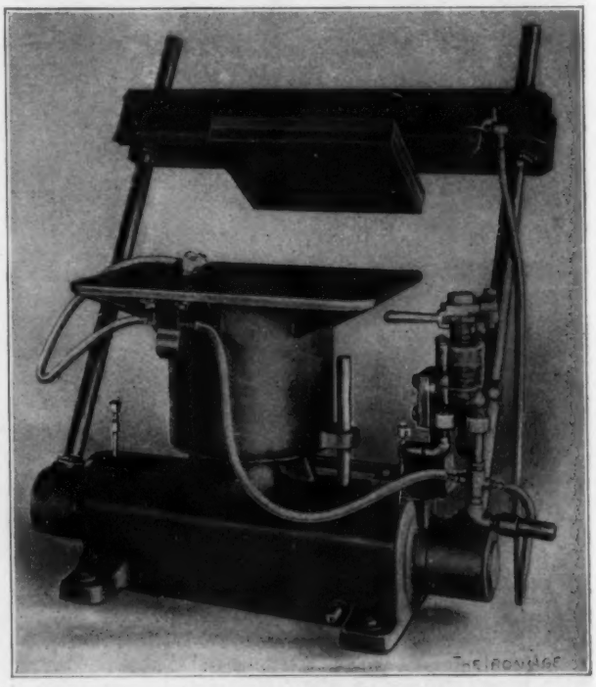
Takata & Co., 10 Wall street, New York, exporters of American goods to Japan, state that a Cooper-Hewitt 48-inch electric lamp was among the few exhibits at the graduation ceremony of the Tokio Imperial University July 11. The Japanese Emperor attended the ceremony, making a departure in this case from his usual custom of keeping closely to his palace. The mercury lamp attracted his attention most, and the head professor of electrical engineering, H. Nakano, a post-graduate of Cornell University, class of 1889, explained its method of working. This lamp was supplied by Takata & Co., who are the agents in Japan for the Westinghouse Electric & Mfg. Co.

The Mumford Molding Machine.

The first of a complete line of molding machines recently placed on the market by the E. H. Mumford Company, Philadelphia, Pa., is illustrated herewith. This machine is of the simple power ramming type and embodies a number of new features.

Between the strain rods, which are of heavy tubing to give lightness, strength and exceptional stiffness, there is a space of 3 feet in the clear. The trunnion shaft joints at the base, which of necessity work in the sand, are protected by wiper rings, preventing the entrance of sand to the bearings. The counterbalance spring, which aids in the swing of the ramming yoke up and back, is housed in the base of the machine away from all possibility of sand clogging, and the projecting of counterweights, spring boxes, &c., which frequently form lodging places for sand, is avoided. The ramming of the molds is performed by the cylinder, which has a 12-inch traverse and has its wearing parts and bearings fully protected from sand and dirt.

The main throttle valve of the machine is the well-known "motorman's" valve type developed in connection with air brake service, where the tightest and most reliable valves are absolutely essential. This machine is particularly intended for that class of work in which loose patterns, or patterns attached to plates, are used without further attaching to the machine, and the vibrator for applying in various ways is shown lying on the table of the machine.



The Mumford Molding Machine.

In connection with the machine the Lovell pattern draft apparatus is used, which permits of an unguided vibrator lift for loose patterns from the drag flask, the guide for the patterns being supported by a separate guide frame, reaching the patterns at the joint with contact so perfect that patterns which have been once drawn from the mold may be returned to it with absolute precision.

In the use of this device the cope half of the mold is lifted while a base plate on the machine is vibrated by separate vibrators operated independently by the knee valve shown at the front of the molding machine. All parts of the machine are made to withstand the wear incident to the work to be performed, the wearing parts are carefully and fully protected from the contact of sand, and the whole machine is built to meet the requirements of the trade after careful investigation and long association of the maker in the molding machine field.

The Ferro-Alloy Case.

Attorney-General Will Not Ask Writ of Certiorari.

WASHINGTON, D. C., August 29, 1905.—The Attorney-General, after a careful investigation occupying more than five months, has decided to deny the request of the Treasury Department for an application to the United States Supreme Court for a writ of certiorari in order to make a final test of the question as to the proper dutiable classification of ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, alloys which were recently held by the United States Circuit Court of Appeals to be subject to duty at $4 per ton by assimilation to ferromanganese, under paragraph 122 of the Tariff act, but which the customs officials contend should be assessed at the rate of 20 per cent. ad valorem as unwrought metals under paragraph 183. The decision of the Department of Justice is a decided disappointment to the officials of the Treasury, but under the circumstances it is not practicable to take any further action in this case at least. There are certain considerations, however, which render it possible that a new case may be made on a future importation of these alloys.

Important Considerations Involved.

In requesting the Attorney-General to apply for a writ of certiorari to the Supreme Court the customs officials were moved by two important considerations. One is the fact that in the case of ferrochrome, for example, the Government would receive duties amounting to $50 per ton if assessed at the rate of 20 per cent. ad valorem as an unwrought metal instead of only $4 as an unenumerated article similar to ferromanganese; while the other is the great interest taken in this controversy by certain domestic manufacturers who are now making several of these products by electrosmelting processes and who claim that if importations are permitted on the basis of a duty of $4 per ton they will be obliged to suspend their operations. In this connection the American manufacturers have filed an elaborate statement in the case, in part as follows:

> Two products, ferrosilicon and ferromanganese, varying in value from $28 per ton in the former to $50 in the latter, are taxed at the rate of $4 per ton. Ferrochrome, a product whose market value is at least $250 a ton, is assessed and dutiable at the same rate. Thus we have two products, one worth about one-eighth and the other about one-fifth of the value of ferrochrome taxed at exactly the same rate. It is true that discrepancies in tariff schedules are usually matters for Congressional action. At the same time, when it can be shown that such discrepancies need not exist if a logical interpretation be put on the laws, it becomes at once the duty of the courts or the executive departments so to apply the laws as to avoid discrepancies or injustice.
>
> Obviously a duty of $4 per ton on an article worth at least $250 per ton when of the best quality affords no protection whatever to the American labor and capital engaged in its production. A plant for the production of high grade ferrochrome represents necessarily the investment of a large amount of capital. Two electrical horse-power will not produce more than a ton of ferrochrome per year, and the labor employed must be of the highest class and consequently expensive. The industry is, moreover, a new one, which under the policy of this Government should receive every protection to which it is entitled under the tariff laws.

Basis of Court Decisions.

Notwithstanding the efforts made by the Government to secure the assessment on these products of a duty higher than $4 per ton both the United States Circuit Court and Circuit Court of Appeals have held them to be properly dutiable at the low rate assessed upon ferromanganese. The Court of Appeals in particular emphasises the difference between these ferro-alloys and "unwrought metals," declaring that no article can be assessed for duty as an unwrought metal unless it is capable of being wrought, and that inasmuch as these alloys are incapable of being wrought into any useful article, but are used only in imparting certain qualities to steel, they cannot be held to be dutiable under paragraph 183.

The Treasury Department's request for a writ of certiorari was forwarded to the Department of Justice last March. In the meantime the matter has been the subject of a very careful investigation in which counsel for the American manufacturers has assisted in the capacity of special United States attorney. Replying to the Treasury Department's request the Acting Attorney-General says that, after careful consideration, he has reached the conclusion that the interests of the Government will not be subserved by making the application for the desired writ, as he feels sure that it would be refused. With regret therefore he declines to make the application and advises the Department that the case may be treated as finally disposed of. He adds that he has had a conference with the special attorney referred to, who substantially concurs with his view of the matter.

Refunds Ordered.

In view of this decision of the Attorney-General the Secretary of the Treasury has addressed the following communication to the Collector at New York:

> The Department is in receipt of a report of the United States Attorney for the Southern District of New York in which he states that the case of the United States *vs.* the Roessler & Hasslacher Chemical Company was recently decided in the United States Circuit Court of Appeals for the Second Circuit adversely to the Government.
>
> The merchandise in suit consisted of certain ferrochrome, ferrotungsten, ferromolybdenum, ferrovanadium, which were assessed for duty as "metals, unwrought," at the rate of 20 per cent. ad valorem under paragraph 183 of the act of July 24, 1897. The importers protested, claiming the merchandise to be dutiable under paragraph 122 of the same act at the rate of $4 per ton by virtue of its similitude to ferromanganese, which claim was sustained by the United States Circuit Court of Appeals, thereby affirming the decision of the United States Circuit Court below.
>
> The Attorney-General advises this Department that no further proceedings will be directed in this case. You are, therefore, hereby authorized to forward the usual certified statement for refund of the duties exacted in excess in settlement thereof.

Under ordinary circumstances this incident might be regarded as permanently closed, but it appears from the records of the Treasury Department that the United States Circuit Court of Appeals in different jurisdictions have rendered adverse opinions as to the proper dutiable classification of these alloys. An important difference in classification is that at New York and Philadelphia, for example, and until the question is finally ruled upon by the United States Supreme Court the collectors of customs at all ports will have no higher authority for the assessment of duty on these articles than may be contained in current instructions from the Treasury Department. Of course until further notice the collectors will follow the ruling of the Department, accepting the decision of the United States Circuit Court of Appeals for the Second Circuit, in accordance with the letter above quoted.

W. L. C.

Duty on Tinned Steel Wire Heddles.—The reappraisement division of the Board of United States General Appraisers, in a decision just promulgated by Eugene G. Hay, has imposed an advance of 2½ per cent. over invoice prices on a heavy consignment of tinned steel wire heddles from Felten & Guilleaume, Carlswerk Actien-Gesellschaft of Mulheim-on-Rhine. The merchandise was entered at Worcester, Mass., but under the rules applicable to undervaluation cases the name of the American importer was not divulged. It is understood, however, that the importer is a large cotton machinery manufacturer of Worcester. There were several hundred thousand heddles in the shipment from Germany, varying in length from 327 to 363 mm. They were invoiced at different prices. The customs authorities at Worcester held up the goods, whereupon an appeal was made to the Board of Appraisers for a review of the Worcester officials' appraisement. General Appraiser Hay finds that the merchandise must stand an advance of 2½ per cent. over entered prices. As every 1 per cent. of advance carries with it a corresponding increase in penalties the actual advance amounts to 5 per cent. Should the full Reappraisement Board affirm Mr. Hay's action no further appeal can be prosecuted.

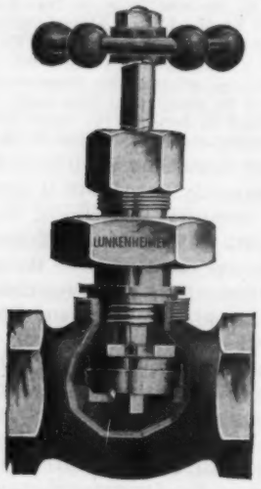
M. Le Chatelier considers the best powders to use for grinding metalographical specimens are the following: Alumina derived from the calcination of ammoniacal alum, commercial flour emery, oxide of chromium derived from the combustion of ammonium bichromate, oxide of iron from the calcination of iron oxalate in air.

Lunkenheimer Improved Regrinding Valves.

The Lunkenheimer Company, Cincinnati, manufacturer of high grade engineering specialties, has made a number of desirable improvements on its regrinding valves. The changes, however, are not radical, as the valve has been in use for half a century and has proved itself to be of the correct design, having given general satisfaction wherever used.

The weight has been increased, not because the thickness of shell, &c., was too light, but merely as an additional precaution against rough handling while attaching. The medium pattern valves are guaranteed to stand a working pressure of 200 pounds per square inch, and the extra heavy pattern up to 300 pounds per square inch. The shape of the valve has also been altered, which not only makes a symmetrical appearance but also increases the area through the valve, permitting an unobstructed passage through it, the area being more than equal to that of the connecting pipe.

To insure a perfect and strong joint between the pipe and valve the pipe threads have been made considerably longer, thereby overcoming the danger of stripping threads, which so often happens, owing to rough and unskilled workmanship in attaching. All sizes of the valves now have lock nuts on the hand wheels, which facilitates the taking apart and assembling of the valve for repairs.



The Lunkenheimer Improved Regrinding Valve.

Referring to the sectional illustration it will be noticed that the hub which carries the operating stem is secured to the body by a union connection, which in turn screws over the shell of the valve body. By means of this construction it is impossible for the hub and the body to become corroded together, as the thread which holds the union ring to the body is protected at all times from the action of the steam, the joint being made between the flanges on the hub and the neck of the body. This tends to make the valve rigid and strong. The disk is held loosely to the stem by means of a lock nut and will therefore adjust itself to the seat very readily and a tight joint can be relied upon.

The stem is fitted with a very strong, durable and long thread, and the manufacturer emphatically states that the valve is very easy to operate, and that there is practically no exertion necessary to close tightly even the largest valves. The reason for this is that the hand wheels are so proportioned in respect to the seat opening that no additional leverage need be applied to the hand wheel to facilitate the operation of the valve.

To regrind the valve the bonnet ring is unscrewed and the trimmings are removed from the body. A wire or nail is placed through the lock nut and stem, a little powdered sand or glass and soap or oil is placed on the disk and the trimmings are again placed in the valve and reground. The bonnet has a small rim or projection on the bottom thereof, which acts as a guide on the inside of the valve neck while regrinding.

The seats in the valve bodies are very small when the valves are sent out from the factory, which permits of considerable regrinding and is considered an important feature.

The valve can be packed under pressure when open or closed. To pack while steam is flowing through the valve it is opened as widely as possible, when the shoulder at the top of the stem thread forms a seat beneath the stuffing box.

The material used is of the highest grade of bronze composition and before being sent out of the factory every valve is thoroughly tested and inspected, the stuffing boxes are packed and they are ready for immediate use. The company has in connection with its plant a complete physical and chemical laboratory, which enables it to manufacture its products of such composition as is best adapted to withstand the chemical actions and strains to which the various products are subjected, thus enabling these products to be fully guaranteed.

The Central Foundry Company.

President Alfred Fowle, Jr., of the Central Foundry Company has submitted to the stockholders his annual report for the fiscal year ending June 30, 1905. Following is the income account compared with the account for the previous year:

	1905.	1904.
Earnings after deducting all operating charges and charges for maintenance of plants and equipment	$511,423	$467,504
Bond interest for year ending June 30, 1905	231,780	231,780
Balance	$279,643	$235,724
Expenditure for equipment for manufacture of Universal pipe and F. & W. fittings, &c.	42,705	.....
Balance, applied to depreciation of properties	$236,938	$237,724

The general balance sheet as of June 30, 1905, compares as follows:

Assets.	1905.	1904.
Plant investment	$15,097,574	$15,345,381
Treasury stock	700,000	700,000
Stock subsidiary companies	1,200,000	1,100,000
Notes receivable from subsidiary companies	.....	117,908
Accounts and bills receivable	501,572	408,022
Inventory	523,320	426,218
Cash	59,989	63,446
Unexpired insurance and taxes	2,012	3,026
Furniture and fixtures	4,771	4,771
Totals	$18,089,239	$18,168,773
Liabilities.		
Capital stock	$14,000,000	$14,000,000
Debenture bonds	3,863,000	3,863,000
Accrued interest	38,630	38,630
Accounts and bills payable	187,609	267,143
Totals	$18,089,239	$18,168,773

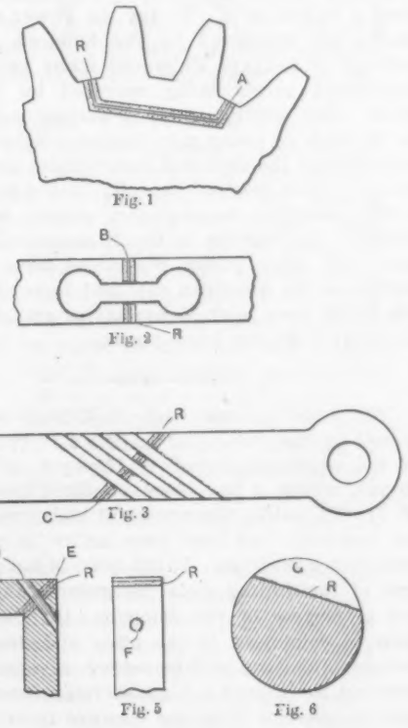
The report says: "The volume of business in soil pipe and fittings has been maintained during the year at fairly satisfactory prices in spite of increasing competition. The sales of Universal pipe and fittings for gas and water service and for other purposes have been very gratifying. This branch of the business, in the opinion of the directors, has now demonstrated its value to the company and should show a steady increase. The Central Radiator Company has added to its equipment, reduced its cost and its product is now favorably known to the trade. The volume of its business is steadily increasing at materially improved prices. The Central Iron & Coal Company, in common with other Southern iron companies, has met with very difficult labor conditions during the year. Notwithstanding these conditions it has maintained a fair output of high grade iron and has demonstrated its ability to operate profitably under adverse conditions. The outlook for future business appears to be favorable, and it is expected the current year will be a profitable one to the company."

The annual meeting of the company was held in Jersey City. The former Board of Directors was re-elected and one more was added to its number. The new director is Herbert H. Spencer.

Method of Reinforcing Brazed Joints.

The difficulty of making a good brazed joint between two pieces of cast iron or high carbon steel, particularly where the two sections were broken apart, has been chiefly due to the fact that the material used for brazing would not flow readily. When a casting is broken there is a weakening of the metal adjoining the fracture and if the break is repaired by brazing there is a tendency to fracture again on lines parallel with the original break. A method devised by John F. Richardson of Pittsburgh provides for inserting between the adjacent faces of the joint to be brazed a thin strip of metal, so that the brazing material will flow over its surface and attach itself to the adjacent surfaces of the metal to be joined. Reinforcing pieces are also employed, these crossing the fracture and being socketed in the metal on either side of the break.

In the illustrations of the method which are shown R represents in each case the brazing material. Fig. 1



A Method of Reinforcing Brazed Joints.

is a side elevation of a gear wheel in which two teeth have been removed and replaced by new teeth. A represents a strip of metal conforming to the shape of the joint. The parts are brazed to each side of the strip by means of a standard flux and a brazing material. Fig. 2 illustrates the method of repairing a broken bar. A joining strip, B, is employed, and in addition a reinforcing piece is socketed in recesses in the parts of the bar. The reinforcing piece is of steel and the brazing material flows freely over its surface and tightly brazes it in the recesses. A joint running at an angle to the sides of the sections to be brazed is shown in Fig. 3. C is the joining strip. Fig. 4 shows a square frame that has been fractured at one corner. The reinforcing piece D is provided in a hole bored at an angle to the sides of the frame and through the joining strip. In Fig. 5 the joining strip F is shown in the center of the side of the frame. A shaft section is represented in Fig. 6. It had been cracked from the periphery toward the center. A joining strip, G, was inserted in the crack. It is found that galvanized sheet steel can be used for the joining strips with best results.

Operations under the Richardson patent for reinforcing and brazing are carried on by the Richardson Cast Iron Brazing Company, Pittsburgh, Pa.

A Foundry Trade School Under Proprietors' Auspices.

At the annual convention of the National Founders' Association held at Cincinnati in November, 1904, John L. Ketcham of the Brown-Ketcham Iron Works, Indianapolis, read a paper on the work of the Winona Technical Institute of Indianapolis in the training of boys for various trades. He suggested that if members of the National Founders' Association would interest themselves in that school to the extent of paying for a number of scholarships at the rate of $100 a year it would be possible to develop a strong foundry department which would compare creditably with departments in which boys were being trained for other trades. There was some response to Mr. Ketcham's appeal. Further steps were taken at a meeting of the Administrative Council of the association in February of this year, when a committee was appointed, consisting of Wm. H. Pfahler of Philadelphia, Richard C. Oliphant of Trenton, N. J., and Geo. H. Gibby of Boston, to investigate and report upon the plan pursued at the Winona Technical Institute in preparing boys for foundry work.

Mr. Pfahler as chairman of the committee visited the institute and thoroughly investigated its plan and its operations. At the last meeting of the Administrative Council, held in Detroit August 7 and 8, 1905, he presented a report on behalf of the committee. The report says that the control and management of the Winona Technical Institute are in the hands of men well known over the country for their ability as business men and their work as citizens, and the committee felt that the work of the school would lead to the attainment of the highest standard of efficiency in the education of boys, aiming to make not only mechanics, but men, and not only hand workers, but brain workers. The institute is located in a park of 75 acres in the best part of the city of Indianapolis, and a number of substantial buildings have been erected, one of which is well adapted to the work of a foundry school. It was believed that a foundry school started under the auspices of the institute and directed by the National Founders' Association would in time provide for members of the association a corps of bright and active young men who could be placed in various plants, not only as highly skilled mechanics, but as assistant superintendents, foremen and teachers of apprentices. It was thought that the school would also furnish the opportunity of selecting promising young men from different foundries and having them complete their training along lines which would be impossible in the shops.

Co-operation of the National Founders' Association.

The committee made the following recommendations, which will be brought before the next convention of the National Founders' Association, in New York City, November 15 and 16:

1. That the council approves the Winona Technical Institute as a means for the higher education of mechanics in our line.
2. That the council unanimously recommends to the next convention that this association shall provide for a standing committee of three members who shall have special charge of the subject and shall co-operate with the directors of the school in their efforts to make it of the greatest possible benefit to our members.
3. That the council, in order to facilitate the early opening of the school, shall pay for the equipment of the foundry at a cost not to exceed $1000.
4. That the council pledge to the directors of the Winona Technical Institute to pay for not less than 30 scholarships at a cost of $100 per annum for each scholar for four years.

In presenting the report of the committee Mr. Pfahler gave the Administrative Council some account of his visit to Indianapolis, prefacing it by saying that while a few foundries are equipped to take boys and make mechanics of them two-thirds of the foundries, by reason of specializing in their work, cannot afford to give their apprentices all around training. He considered that the efforts being made through training schools only partly solved the problem. He had made a study of many training schools and considered they were not making mechanics. "They are teaching boys a certain amount of skill, but not enough to enable these boys to go out and stand alone, and when they are put into the foun-

dries they are brought under the influence of the union and prevented from making any progress." Mr. Pfahler believed that the Winona Technical Institute is creating just the class of men the foundrymen need. It aims to make all around mechanics and all around men. The intention is to take into the institute no one who is not able to pay his tuition, which will be $100 a year. However, provision is made through scholarships by which it is possible to take in boys not able to pay the tuition, by loaning them the money. Already there have been established schools of electrical work, pharmacy, house painting, decoration and lithography. The last named is under the auspices of the Western Lithographers' Association. "Of all of the boys educated at that school a few have paid their way. A few have been taken up because of their peculiar characteristics, but they have been obligated to pay for everything at the school, and are paying it like men. The school has not lost 5 per cent. If I contribute $100 a year for four years for a scholarship, when the boy pays it back he becomes a donor of the $100, and that goes on perpetually."

The Course in Foundry Work.

Mr. Pfahler outlined the course which was under consideration for the foundry school, as follows:

1. Preparing and mixing sand.
2. Making and baking cores.
3. Facings, their use and preparation.
4. Bench molding of ordinary patterns.
5. Match plate work.
6. Making sand and plaster follow boards.
7. Floor molding. (*a*) Casting of patterns of complicated form which require the use of drawbacks, anchor plates, checks, &c. (*b*) Dry sand, loam and pit molding. (*c*) Sweep work and green sand core making.
8. Cupola management. (*a*) Cleaning, lining, preparing charges of iron. (*b*) Charging, melting and management of cupola.
9. Cleaning and tumbling castings.

Supplementary Instruction.

1. An elementary study of the laws of heat, combustion and gases.
2. Mechanical properties of the different grades of pig iron and their mixtures.
3. The methods of storing and checking patterns.
4. Estimates and prices and source of materials.
5. Excursions to commercial establishments and a study of their methods.

In concluding his report Mr. Pfahler said: "The education which a boy gets in that foundry not only equips him for a good mechanic, but it gives him the ability of management, and he will come from that school equipped to supply the greatest want in the foundry trade to-day, which is the foundry foreman. I believe two-thirds of the money we have spent in defending members of this association has been primarily due to incompetent superintendents and foundry foremen. These boys will have an inspiration which will lead them to aspire to higher places, and we can draw upon that school for men of a higher character."

Among those interested in the Winona Technical Institute are Hugh H. Hanna, Atlas Engine Works, Indianapolis; John H. Holliday, president Union Trust Company, Indianapolis; H. J. Heinz, Pittsburgh; Alexander McDonald, Cincinnati; John M. Studebaker, South Bend; Hon. Jesse Overstreet, and others of equal prominence.

The Green Economizer.

The Green Fuel Economizer Company, Matteawan, N. Y., has just completed the erection of a large shop designed to provide for its rapidly increasing business. This company not only supplies special exhausters with bearings removed from the action of the flue gases for mechanical draft in connection with the widely used Green fuel economizer, but also builds fans, blowers and exhausters for every purpose, having, for instance, recently sold fans for heating, ventilating and humidifying in textile mills, ventilating and drying in paper mills, heating and ventilating in large buildings, &c. It is just now installing the largest mechanical draft exhauster ever built for a factory in Massachusetts.

New designs have been worked out for all types of Green-Matteawan fans with the special object of reducing the power required for driving. Fans are often driven by small noncondensing engines or by electric motors using purchased electric power; hence this is quite an important matter. Fan builders, however, under the stress of competition and to increase profits have frequently offered small, inefficient high speed fans where true economy for the purchaser would have indicated larger, slower moving fans. The power consumed by a fan runs up very rapidly with the speed.

The Green Fuel Economizer Company does not contract for the engineering of plants or for the installation of heating and ventilating plants in competition with the heating and ventilating contractors, but freely offers the advantages of its engineering skill and 60 years' experience in the construction and operation of air moving plants.

A Decade of Electric Power at Niagara Falls.—On August 26, ten years ago, the Niagara Falls Power Company sent out its initial supply of electric power to its first customer, the Pittsburgh Reduction Company. This was for the operation of the upper plant of the Reduction Company, which was the first factory to be located on the Power Company's lands. The second block of power was supplied to the Carborundum Company about a month later. To-day the Power Company's consumers are numbered by the hundred, nearly all the factories of Niagara Falls and many in Buffalo and at intervening points being operated by this company's power. The electric power development has resulted in the location of many new electro-chemical industries in proximity to the falls and has doubled the population of the city. The original capacity of the power plant was 50,000 electrical horse-power, which has since been doubled. In addition to the Niagara Falls Power Company two other power companies have come into existence on the American side and three on the Canadian side of the river, with plants having an available capacity of nearly 1,000,000 horse-power.

The Allis-Chalmers Club, at Milwaukee, was formally opened on the evening of August 25. The club is located at the southeast corner of Hanover and South Pierce streets, within a few blocks of the Clinton street plant. W. H. Whiteside, vice-president and general manager of the company, has been very active in establishing the club on a good basis. It has been organized for the purpose of facilitating social intercourse among the officers and employees of the company, the membership being open to employees in the office and drawing room. A noonday luncheon will be served, a separate room being reserved for women. A membership fee of $1 is charged and the receipts from the fees are to be applied toward the purchase and maintenance of a library for the use of club members. A board of management has been appointed from heads of departments and the engineering and office departments and consists of David Harlowe, W. E. Dodds, Almon Emery, W. S. Heger, T. J. Illing, J. A. Milne, Carl Printz and H. Shiffian. The building secured for the club house was formerly used as a residence, but is well adapted to the present purpose. It is large, affording ample room, and is surrounded by beautiful grounds. A uniform price of 35 cents for men and 25 cents for women will be charged for the noonday luncheon.

The thermal efficiency of a good gas engine being about double that of a good steam engine of the same size, it remains only to obtain a fuel for the gas engine which in reliability and cost shall produce power so as to compete with the steam engine. With this idea in view the gas producer has been developed, its function being to produce directly from coal of a cheap grade a gas which can be used in the cylinder of a gas engine. The efficiency of such a device is usually about 60 per cent., as against 80 per cent. for a good steam boiler. The gas engine has an efficiency of some 30 per cent., as compared with not over 15 for the steam engine. The combined efficiency from the fuel to the power is thus about 18 per cent. for the producer outfit and 12 per cent. for steam.

The Restriction of Output.

Regulation of Production by Machinists' Organizations.

WASHINGTON, D. C., August 29, 1905.—The forthcoming report of the Bureau of Labor upon the restriction of output in the manufacturing trades, the features of which relating to the production of iron and steel were presented in *The Iron Age* for August 24, will contain an interesting chapter dealing with the regulation of output by the machinists' organizations. It discusses at length the restriction of machinists to one machine, the effect upon output of the introduction of high speed tool steel and the opposition of the unions to the piecework, bonus, premium and other plans for increasing production and reducing labor costs. Following is an abstract of these features of the report:

Two questions closely related have caused a great amount of friction in the machinists' trade: First, the jurisdiction of machinists' work or kinds of machines which the union claims for its members, and, second, the number of machines the machinist may operate. In both of these questions there is a wide margin of indefiniteness, and this leaves it in the power of local and shop committees to extend the rules, often without reference to the position of the International Association of Machinists.

Classification of Machinists.

The absence of any definite classification as to just what constitutes a machinist's work is one of the principal objections raised by manufacturers. All machine shops employ a large number of so-called "handy" men, who in some union shops are permitted by the shop committee to do certain kinds of work, while in other shops they are not permitted to do the same kind of work, and even in the same shop it is claimed by many manufacturers that if the thing could be done one day it was no guarantee that it could be done without interference on another day. To quote a large Chicago employer: "Too much depends upon the daily whim of the shop committee in the matter of placing 'handy' men and in the classification of work." It should be stated that the machinists have never admitted this term and do not recognize the "handy" man at all. They say there are machinists and helpers.

Since 1901 the atmosphere has been cleared considerably by the definition of a machinist adopted in an agreement with the National Metal Trades Association. According to this agreement a machinist is "a competent general workman, competent floor hand, competent lathe hand, competent vise hand, competent planer hand, shaper, milling machine, slotting machine, die sinker, boring mill hand, tool maker." To be considered in either class he shall be able to take any piece of work pertaining to his class, with drawing or blue prints, and prosecute the work to successful completion within a reasonable time. He shall also have served a regular apprenticeship or worked at the trade four years.

The Milwaukee convention of May, 1903, further simplified matters by admitting specialized workmen, though not all around machinists, to a classified membership in the association, but excluding those who are properly called handy men.

One-Man-One-Machine Rule.

The second question, that of the number of machines to be operated by one man, is also indefinite at many points owing to the wonderful evolution of automatic and semiautomatic machinery. The one-man-one-machine rule expresses the protest of the trade against the breaking down of a custom which ossified during a period when machines were comparatively new and comparatively crude. It is also evident that the development of automatic machines and the introduction of more or less automatic features in machines not altogether automatic are compelling a modification of that expression of protest, inasmuch as a provision is made whereby the local lodges, under the sanction of the grand lodge, can and do very often permit the operation of more than one machine by one man.

Owing to the fact that the one-man-one-machine rule has aroused intense opposition on the part of the employers—and it has often been assumed that the rule applies to automatic or semiautomatic machinery—a special effort has been made to discover exactly at what point the union draws the line. It appears that there is no restriction whatever on one man running more than one machine when such machine comes under the classification known as automatic machinery or double machines.

Automatic machines as defined by the union are such machines as require no special skill to supervise them, the only skill necessary being to adjust the tool or cutter. The machine being once set in motion performs the work without further supervision. Screw machines, tack machines, universal gear cutters and shafting collar machines are examples of this kind of machinery. In some instances one man has charge of five or six of these machines, and this with the approval of the union.

Double or twin machines are such as are built with practically two machines upon a single foundation or bed. Such are wheel lathes, slotters, and planers having two or more tool heads. These machines have been built and introduced by the manufacturers largely to overcome the objection found among machinists, organized and unorganized, against one man running two single machines, and they are considered and accepted by the union as one machine.

The Operative's View.

The statement of the officers of the International Association of Machinists covering the points involved is to this effect: The reason the rule is set aside in cases of automatic machinery is apparent from this fact, that after the materials, tools and cutters have been properly adjusted and the machine started it does satisfactory work without constant supervision and leaves ample time for the machinist or operator to put in fresh material and adjust the other machines in his charge. But ordinarily, when running two single machines, the workman must have his back to one while attending the other, and it frequently happens that while attending the machine in front of him the machine behind him reaches the point where it should be stopped; otherwise the cutter will continue and cause damage to the material or to the working parts of the machine itself. In such cases the workman is practically between the devil and the deep sea. He may be adjusting a heavy piece of the material on one machine, and be in a position where he cannot let go or drop it without injury to himself or the material, or both; yet a glance at the other machine tells him that it should be stopped, or possibly there may be something wrong with it which would demand immediate attention. In such cases whatever he does may result in damage, and he, being responsible for the work, must stand the loss and possibly lose his job.

Effect of Restriction.

The question of amount of restriction imposed by this rule is difficult to determine because of the fact that establishments making large machinery do not find it restrictive at all, as they have few or no machines of which one man could operate more than one. Establishments making smaller work find it restrictive, but with the element of uncertainty that there is no definite understanding as to just what machines the union would permit outside of the rule.

A large Chicago establishment having 600 employees, 250 of them machinists, running an open shop under union rules, claims that the one-man-one-machine rule necessitates the employment of 10 per cent. more machinists and that the rule is in force absolutely.

A plant in one of the smaller cities of Illinois, employing 75 machinists, states that "the one-man-one-machine rule is in vogue and restricts to a certain extent, necessitating the employment of about six additional men. Have not tried to break the rule recently. Put men on two machines once or twice the past year, but they soon quit. We have no automatic machines."

A large employer of labor, running a union plant and employing 120 machinists, stated that the one-man-one-machine rule required the employment of only six additional men in that establishment, as there were but six machines where he would put one man to tend more than

one machine, even under nonunion conditions. One of these cases was where boring a cylinder, the cylinder having been placed and the machine adjusted and started to work, required 15 hours to complete the job. On similar work done in a nonunion plant three men tend ten of these machines.

High Speed Tool Steel.

At the beginning of the year 1902 there appeared on the market a highly carbonized steel to be used in the construction of tools for planing and boring machinery. There are now some half dozen brands of this new tool steel, its principal characteristic and all that is necessary to explain for the purpose of this report being that it will stand a much higher rate of speed on the machine, take a deeper cut and last longer without sharpening than any tool heretofore known.

The increase of output from the employment of this steel is reported as being from 25 to 200 per cent., according to the character of the work. One plant reports that it used to get 50 hubs per day, sharpening the cutters every six hours, but with the new steel it gets out 150 hubs. The tool had worked 90 days at the date of the report and had never up to that time been sharpened. The bolt department of a car shop reports that it gets 22,000 ⅝-inch bolts without sharpening the tool, as against 6000 formerly.

Of course the question of slow speed and light feed with this steel is somewhat different from that with the old steel, as the workmen claim that they are giving the machine all that it will stand, it being understood, of course, that machines built for the old steel would not be able to carry a tool of the new steel at the rate of speed and feed which the new tool would stand. This is admitted by the manufacturers, who claim that the workmen in many instances, however, do not give the machine all it will stand.

New machinery is being rapidly built sufficiently strong and compact to force this tool steel through the metal at the higher rate for which it is designed. Much machinery is being built in this country for export to replace old machinery and make possible the use of the newer methods. One New England establishment is building drill presses for an English concern, the same plant having formerly built the presses now used by the English house. A good idea of the steel and the machine required in its use can be gathered from these drill presses. The one formerly built cost $350, manufacturer's price. It would drill a hole through castings 2 inches in diameter and 6 inches deep in 15 minutes. The presses now being built will cost $1000, manufacturer's price, and will drill the same hole the same depth in 1 minute.

Steel Shavings Set a Floor Afire.

A superintendent of a plant in Chicago, who was interviewed for this report, when asked about the restrictions of the machinists along the line of slow speed and light feed invited an inspection of his machine room. At a lathe turning a steel axle the floor of the shop had been protected by large pieces of sheet iron, zinc, &c. The superintendent requested a man to remove these protections from the floor, when the steel shavings as they fell from the point of the tool set the floor afire. The cuts were ½ inch wide, with ⅛ inch feed, or, in other words, the shaving would be ⅛ inch thick as it came off the axle. The superintendent merely stated that he thought that when the speed and feed of machinery gave the employer a cutting which kept the tool at an almost white heat and the shavings hot enough to set the floor on fire charges of restriction of output were hardly in order. It should be said here that factory foremen and superintendents are much more cautious in talking about the machinists' alleged opposition to this high speed steel than the managers and officials of the company. The men in the office, buying the steel upon the manufacturer's statement that it will produce three times as much as the old steel and then finding that they get only from 50 to 75 per cent., and in rare cases 100 per cent., more output, are prone to see in it only deliberate restriction or holding back on the part of the workmen. The foreman and superintendent, however, who see the belt break and the machine quiver on its foundation realize that the fault is not always with the men, but that the entire machinery of the establishment will have to be rebuilt on heavier patterns before the full benefit of this new speed steel can be safely secured.

The workmen claim also that in turning a piece of steel, a line shaft, for instance, with this new steel and giving the latter all the cut and feed and speed that it will stand, the shaft is so heated that it expands, and when the machinist is through and the piece cools its surface, instead of being smooth and even, is full of depressions and raised surfaces, and it is necessary to go over the piece a second time at slower speed and lighter feed to get an even surface. Most manufacturers, however, discount this statement by saying that there is almost no machinery work which is finished or attempted to be finished by the first going over, and it is only on a rough cut or a first going over that the full feed and speed of the new tool steel are expected.

It is admitted by many of the men that they were very much alarmed at first by the introduction of these new cutting tools, but so far there has been no serious displacement of men as a result of it, and if, as some manufacturers assert, all machine shop machines must be rebuilt, there will be an increase rather than a decrease in the number of workmen required, for some time at least, to build the large machines. As one manufacturer in Massachusetts pointed out, a considerable amount of the "scare" in this matter is unjustified because a very large percentage of machinery production is of so fine grade and must be so carefully and minutely done that, no matter what the capability of the tool or machine, neither speed nor feed can be greatly increased in the manufacture of the large bulk of fine work.

Piecework System.

Union machinists affirm that their work is not one which can be put upon the piece price basis with any degree of fairness to the men; that there is such a wide diversity of work, so many pieces to be made, so few of a kind, that the piece price system is not adapted to the industry. They say that when in special cases an establishment has enough of one piece to keep a man constantly employed on that, so that by specialized energy he can earn wages at a piece rate, the result is that by the time he has so adapted himself he has ceased to be an all round machinist, and that there are so few cases in which even this is possible that this system of payment of wages ought not to be tolerated in machine shops.

The machinists' organization, in common with all the other trade unions in the machine industry, discontinues piecework as soon as it gets the power, even at a greatly reduced earning capacity. This is especially true of iron molding. Where quality is especially important the piecework system, even where introduced, is soon abandoned, as in machine tool making.

One of the largest machine tool manufacturers in the United States, who was interviewed, said that he knows of no manufacturer of machine tools in the United States who has successfully experimented with the piecework system of payment. The quality of the work is of so great importance that piece and premium systems of payment would destroy the reputation of an establishment. As a rule, he considers that his workmen would turn out 20 to 25 per cent. greater product if paid on the piece or premium plan, but with the effect of injuring the quality. The piece and premium systems are hard on the machines—the attendant bangs the machine—and on the careful work required in machine tool manufacture this soon puts the machine out of commission. Machine tool manufacturers have therefore universally abandoned these methods of payment. The difference in the amount of work turned out is made up in the quality of the work, and this manufacturer spends large sums in perfecting machinery, which he considers the most important consideration. The high standard of American machine tools could not be maintained on a piece or premium method of payment.

Greater Output Secured.

Employers claim quite generally that the piecework system gives them from 15 to 25 per cent. greater output

than they can secure on the day wage basis, and this is so universally conceded by members of the union that the statistical comparisons which might be submitted would not add to the discussion.

One Chicago employer who had tried both methods said: "We get 25 per cent. more product out of the same man at piecework than at day work, but we do not want it; we have abandoned it and for good."

The objection to the piece rate system from the unionists' point of view is that, while under a day wage system the harder a man works the more his employer will be likely to pay him, under a piece price the opposite is likely to result. They say day wages go up, piece prices always go down, and if at the same piece price a man earns much more than the day's wage the piece rate is immediately cut, so that at his new rate of speed he earns the old wages.

Bonus, Premium and Differential Plans.

The unions which object to piecework are found to be equally opposed to the modified systems known as the bonus, premium and differential piece plans. The premium plan is an application of production to methods long in use in connection with sales. Under this plan a workman is paid by the day and for this daily pay is expected to produce a certain minimum of product, while for any excess beyond that amount he is paid a premium, the amount of this premium being based on the excess and being less per unit of product than the old wage cost. It will be seen that in this premium plan there are two elements—"time base," or time limit, and the rate of premium. The successful working of the plan depends on great care in adjusting these two elements. In practice, where a workman earns more than the employer thinks he should the premium rate is likely to be reduced, but much more important in the eyes of the workman than cutting the premium rate is the danger of cutting the time limit. It is plain that when the employer cuts the time basis he requires a larger output before any premium can be earned, but when he cuts the premium rate he only lessens by so much the stimulus to earn a premium. The time base under this system is practically a task or dead line, and the man who continuously fails to get his work done within the time limit is discharged. Consequently, to cut the time base increases the task and compels all the men to get out a larger output in order to earn their day's wage. But to cut the premium rate affects only the individual, since he is not compelled to earn a premium if he does not wish to. The real temptation under this system, when the men are found to be earning enormous premiums, as is seen to be often the case, is the temptation to cut the time base.

The bonus system is quite similar to, if not practically the same as, the premium system. Under it the workman produces a definite output in a specified time and receives a definite addition to his day rate for the production of a specified amount over and above this product. Under the premium plan, on the other hand, the task feature takes the form of the time base—that is to say, the performance of specific operation is to occur within a specified time at the hourly rate of wages agreed upon for the man's labor. He then receives a percentage of his regular hourly rate for the time saved on the job. The two methods are the same in principle, but the calculation is reversed—that is, in the bonus system the additional pay is calculated according to the additional number of pieces produced in a given time, while in the premium system the additional pay is calculated by the amount of time saved on a given number of pieces.

The differential rate system of piecework is exactly the opposite of the premium plan in that a higher rate per piece is paid if the work is done in shorter time than the time base, while a lower rate per piece is paid if it is done in a longer time than the time base. Suppose 20 units or pieces to be the largest amount of work of a certain kind that can be done in a day. Under the differential rate system, if a workman finishes 20 pieces per day, and all of these pieces are perfect, he receives, say, 15 cents per piece, making his pay for the day $15 \times 20 =$ $3. If, however, he works too slowly and turns out, say, only 19 pieces, then, instead of receiving 15 cents per piece he gets only 12 cents per piece, making his pay for the day $12 \times 19 =$ $2.28, instead of $3 per day.

It will be seen from the above statements that the differential piece rate system, by cutting rate of pay on each piece, penalizes a man who does not produce the given number of pieces in the allotted time, while the premium plan guarantees to him his day's wages, whether he produces the given number of pieces or not. In the premium plan there is theoretically no penalty for not producing the given output, though in practice the man who fails to produce it is sooner or later discharged.

Systems Result in Specialization.

It should be constantly borne in mind, when comparing output per hour or day under any of these systems with the same under the day work plan, that each of these plans leads in practical working directly to the specialization of the work and the workman. Operations which are in day shops performed by two or three different men on different machines, involving the frequent changing of the piece and carrying it from operator to operator, would under the premium plan all be done by one man on one machine, with large numbers of identical pieces given out at a time. Under this specialization the workman comes habitually to making every "lick" count, and the whole mechanism of the shop, the laborers and helpers, come to be trained to a more time and effort saving method of work, which extends to those who are not included in the premium as well as to those who are. A great deal of the time saved in factories which change from day work to the premium plan, credit for which is claimed by the advocates of the premium or other piece rate system, is really due to this specialization of work and more methodical shop regulation.

W. L. C.

Import Appraisements.

The United States Circuit Court for the Eastern District of Pennsylvania has handed down a decision dealing with methods of appraisements which is of general interest. The specific case decided by the court stood in the name of Meyer, Ebeling & Co. The question raised by the importers was as to the legality of appraisements made by the appraiser at Philadelphia. It appears that the appraiser, instead of ascertaining the market value of each article of imported merchandise, totaled the invoice price and disallowed certain discounts to which the importers were entitled in order to raise the result to the market value of the goods.

It was maintained by the importers that the appraiser erred and that his action was not legal. Judge Holland, however, holds that the appraisement was not illegal and that the importers' proper remedy, if dissatisfied, was to ask for a reappraisement in conformity with Section 13 of the Customs Administrative act of 1890.

Meyer, Ebeling & Co., in their assignment of errors filed with the court, allege: "On the invoices the prices of the goods were arrived at by stating a gross price and then deducting on the face of the invoices certain discounts, leaving a net invoice price. The appraiser wrongfully disallowed these discounts, and the collector imposed the duty upon the gross price, with these discounts added to the net prices as stated in the invoices. There is nothing on the face of the appraiser's returns to show any appraisement by him of the value of the goods other than by disallowing the said discounts. The only question involved is one of law—namely, whether the action of the appraiser, as shown by his official return, in disallowing the discounts, justified the liquidation by the collector of duty upon the amount obtained by adding the discounts so disallowed to the net price of the goods as shown by the invoice." Both the Board of Appraisers and the Circuit Court answer the question of the importers in the negative. It is possible that the case will be taken to the Federal Circuit Court of Appeals.

The Manufacture and Properties of Charcoal.

BY S. H. STUPAKOFF.

There are two methods in vogue for making charcoal, which are quite similar to those employed in producing coke from coal. One is to char the wood in retorts and the other to partly burn it in heaps, pits or beehive ovens. Of late the former has been gaining ground, especially on account of the recovery of valuable by-products from the distillation of the wood. Besides a combustible gas it yields a tarry substance and an aqueous acid vapor, which is condensible. From these in turn can be obtained by fractional distillation creosote, acetic acid, methyl alcohol and many compounds analogous to those obtained from coal tar. The prices realized from the sale of wood alcohol and acetic acid represent a larger amount than the value of the charcoal itself. Wm. G. Mather in a paper read before the Lake Superior Mining Institute estimated the production of wood alcohol in the State of Michigan alone at over 1 1-3 million gallons for the year 1903. In 1902 it sold at 60 cents and in 1903 at 45 cents a gallon, the drop in price having been caused by increased production all over the country. A new and promising field for the sale of wood alcohol may be found upon further development of the alcohol motor. Much thought and energy are being expended at present to bring it to perfection. Its development and manufacture are being pushed in Germany and France; in England it is seriously thought of and in the United States it is shelved perhaps chiefly on account of the high Government tax on alcohol. The remarkable efficiency of 32.7 per cent. obtained with the Marienfeld alcohol motor compares very favorably with the efficiency of the best gas engines, which never exceeded 31 per cent. and usually runs between 20 and 25 per cent., or with ordinary petroleum motors, which have about 17 per cent., and the best steam engines, which, including the boilers, have about 12 per cent. efficiency.

Charcoal and Coke Irons.

The principal use for charcoal is in the manufacture of charcoal iron. Sweden produces charcoal iron almost exclusively and Russia very largely, though coke iron production in Russia has increased in late years. Sweden made in 1904 516,900 metric tons (2204 pounds). Much of it was exported and went into the manufacture of steel. Russia does not export. It uses most of its iron for the making of steel and an excellent, close grained, tough wrought iron. Its pig iron output in 1904 was 2,839,800 gross tons. The United States produces about 1 ton of charcoal iron to every 50 tons of coke iron. The production of charcoal iron in 1904 was but 337,529 tons—insignificant when compared with 16,497,033 tons of coke iron produced in the same year. The use of charcoal iron in the United States has been fairly well maintained in recent years. In 1860 the production was 248,510; last year, 337,529 tons. But when we put alongside of this the vast increase in the manufacture and use of coke irons, which was no less than about 2000 per cent. between 1860 and last year, we see that charcoal iron has fallen far behind in the race.

The price of charcoal iron dropped steadily after 1864 from $76 per ton to an average of about $15 in 1904. In 1898, during the general depression of business, it reached the lowest notch, being sold at $10.26, f.o.b. furnace. The difference in value between coke and charcoal iron suffered a decrease of more than 50 per cent. within the last 20 years. To-day charcoal iron is sold at an advance of from $1 to $2 over coke iron.

The Inroads on Timber Lands.

A bushel of Michigan charcoal weighs about 20 pounds. To make 100 bushels requires from 2½ to 3 cords of wood (320 cubic feet), and 90 bushels used as fuel per ton of iron is considered at the present day to be good furnace practice. Counting 35 cords of wood to the acre there are annually cut down 24,300 acres, or about 40 square miles, of solid woodland for the fuel required in charcoal iron manufacture in the United States. These figures are based on present practice and the rate of production and consumption in the past few years.*

Charcoal has been used with good results for the making of producer gas for gas engines in sections of the country where wood is plentiful and coal or coke expensive. Individual plants of this kind are to be found in some of the Western mining districts and in Mexico. It is on record that charcoal was sold by contract in 1875 at American Fort, Utah, for 18 cents a bushel, whereas coke cost at that time and locality $45 a ton. One pound of charcoal will yield sufficient gas in a gas producer to give with a good gas engine 1 horse-power for one hour.

Other principal applications of charcoal are as facing in foundry practice, as a powerful reducing agent in metallurgical processes, as fuel, as a filtering substance and as an absorbent for noxious effluvia.

The main characteristics of charcoal† may be enumerated as follows: It is hard, brittle and rings when struck. It is black, represents a conchoidal fracture and retains the original form of the wood from which it has been made. It is infusible, is not dissolved by water and acids and when cold is a bad conductor of heat and electricity. It varies in compactness according to the nature of the wood from which it is made and according to its process of manufacture, and it burns without a flame.

Wood and Other Charcoals.

Boxwood charcoal is one of the most solid, and willow, dogwood and alderwood are among the most porous. Charcoal made from Scotch fir weighs from 10.3 to 10.9 pounds per cubic foot. Regnault has determined its specific heat to be 0.2411. It has a calorific intensity in air of about 2700 degrees C. When consumed it leaves as residue from 1 to 5 per cent. ashes. The higher the temperature at which it is being made the higher is its ignition point. If made at the temperature of melting platinum (1780 degrees C.) it requires 1250 degrees C. to ignite it. With its high absorption of gases considerable heat is developed, which has been asserted to be the frequent cause of its spontaneous ignition. Freshly made boxwood charcoal absorbs at ordinary temperature and under mean atmospheric pressure‡ 90 volumes of ammonia, 85 of hydrochloric acid, 65 of sulphurous anhydride, 55 of sulphurated hydrogen, 35 of carbonic anhydride (9.25 O, 6.5 N and 1.25 H). The absorption of gases increases nearly in the ratio of pressures to which the charcoal is exposed.§

Mushet's experiments with 17 varieties of wood gave a maximum and minimum percentage of 72.463 to 83.095 of volatile matter, 16.456 to 26.857 of charcoal and 0.355 to 1.792 of ashes. The yield varies with the nature of the wood and the method of manufacture. An old observation is that it takes 10 horses to draw the wood and three to draw the charcoal. Long continued and moderate heating yields a larger quantity of charcoal.

The purest charcoal is made of organic substances such as starch and sugar. It is also made from the distillation of petroleum, which furnishes a good substance for electric arc light carbons, or from the distillation of coal gas, which is known as coal gas charcoal, or gas carbon. This makes good negative poles for batteries. Charcoal results also from the burning of resinous substances, which yield lampblack, some of which is used for the making of india ink; also from peat, which is a soft and friable charcoal, containing about 45 per cent. ashes, and unsuitable for blast furnace practice; and, lastly, from bone, or horny substances, which give us the well-known animal charcoal, or bone black. This last contains about 14 per cent. carbon, 80 per cent. calcic phosphate and 5 per cent. calcic carbon, and it finds numerous applications as a discoloring, deodorizing and filtering agent. It removes or absorbs putrid organic substances, it serves as a pigment, finds several uses as ivory black, is a good fertilizer and is recommended

* A single firm in the Ural Mountains consumes about 500,000 cords of wood annually, of which the largest portion is turned into charcoal before use.

† From "Encyclopædia Britannica."

‡ Saussure in "Encyclopædia Britannica."

§ Charcoal from peat combines the greater absorbent power of wood charcoal with the greater efficacy of platinum sponge as a promoter of chemical action.

as an antidote for phosphorus poisoning. It can be readily repurified by washing with acids and by ignition.

The Absorbent Power of Charcoal.

Freshly burnt charcoal absorbs from 9.6 to 18 per cent. of its own weight of atmosphere moisture. The commercial article contains usually about 12 per cent. Selected small pieces of perfectly dry charcoal have increased about 1¾ per cent. in weight after keeping them for a week in the laboratory, whereas they have gained 8 per cent. by placing them for the same length of time under roof in the open air in very damp and cold weather. It was not ascertained whether this increase in weight was caused by the absorption of water or air, but perhaps is was due to both. But these observations can hardly serve as conclusive evidence of what is taking place under ordinary conditions. The data below are more reliable as indicating what is taking place in every day practice.

Kiln burnt charcoal which was stored in heaps for one and one-half years in the yard contained 2.18 per cent. water. After three years' storage in the same place the water amounted to nearly 18 per cent. Piled up in heaps in the woods charcoal has absorbed after two years 22½ per cent. and after three and one-half years 24 per cent. of water. Hard retort charcoal contained after three months' storage 1.88 per cent. and soft retort charcoal 2.55 per cent. moisture. A special case is on record where charcoal one year old made of birch wood had absorbed 55¼ per cent. of water. Artificially water soaked charcoal of birch was found to contain 67 per cent.; pine charcoal, 74 per cent., and fir charcoal, 79 per cent. of their original weights.

Soft charcoal absorbs more water than hard, and kiln coal more than retort oven coal. Burnt charcoal, which is distinguished from the normal product by its brittle and sometimes rotten character, absorbs water more readily than charcoal of good quality, but its calorific value is nearly the same as that of the latter.

Stored charcoal is better than the freshly burnt product, but it should not be exposed to the weather. Too long extended storage again reduces its heating value through having absorbed an undue quantity of moisture, which destroys at the same time its strength or resistance to crushing.

The avidity with which charcoal takes up gases has been mentioned above. One volume free from water absorbs from 17½ to 28½ of air or gas. If heated to 200 degrees C. and then slowly cooled double the quantity can be absorbed. A small percentage of moisture changes this factor considerably. As little as 1½ per cent. will reduce it to less than one-half, and if the water should be freshly absorbed it will drive out the greater portion of air which it previously contained.

A recent United States consular report states that according to a German scientific journal Professor Dewar has made the discovery that charcoal possesses the property of producing a high vacuum if previously exposed to the temperature of liquid air. This promises therefore a new field for its application, as for the manufacture of incandescent lamps, &c., which so far can be made only by the slow working action of the mercury pump. With the aid of charcoal and liquid air the same object can be accomplished in a few minutes.

Effects of Different Temperatures.

Charcoal which has not been sufficiently burnt is of a brown color. It assumes its blackness only after it contains 75 per cent. carbon, and to obtain this percentage a minimum temperature of 285 degrees C. (545 degrees F.) for carbonization is necessary. Very poorly burnt charcoal in which some of the wood fiber had remained undestroyed and which had been made at about 185 degrees C. (365 degrees F.) analyzed 56.45 per cent. carbon. Brown colored kiln charcoal burnt at about 220 degrees C. (430 degrees F.) gave 59.78 per cent., and another poor grade of retort pine charcoal of about 280 degrees C. (545 degrees F.) gave 68.41 per cent carbon.

Considerable changes in weight are noticeable within certain limits of temperature when charcoal is heated with exclusion of air. This leads to the conclusion that 350 degrees C. (660 degrees F.) is the approximate temperature in retorts and 700 degrees C. (1290 degrees F.) the temperature in kilns at which apparently carbonization takes place in the respective processes. The calorific value of charcoal is diminished when it is heated during its carbonization process beyond 854 degrees C. (1570 degrees F.). At this point it parts freely with its contents of hydrogen.

A mean of 112 analyses of charcoal blast furnace gases gave by volume 14 per cent. CO^2, 23 per cent. CO, 0.2 per cent. O, 7.7 per cent. H, 1.2 per cent. CH_4, 54 per cent. N. The calorific value of this gas was calculated to 1015 calories per cubic meter. By actual measurement it was found to be 984 calories per cubic meter.

Some of the principal characteristics of charcoal are condensed in the accompanying table:

Characteristics of Charcoal.

	Mean value.				Heat value.	Specific gravity.			Per cent. of volume.		Resistance to pressure in kg. per cu. cm. Across fibers.	Along fibers.	Melting value. Lbs. of iron per cu. ft.	Weight per cu. ft. in lbs.
	% C.	% H.	% O + N.	% Ash.	Cal.	Powder.	Pieces.	Heaped.	Pores.	Carbon.				
Birch	75.04	3.49	19.83	0.90	6,380	1.54	0.40	0.190	72.3	27.7	24.8	204.0	15.5	11.84
Pine	75.38	4.13	17.17	1.24	6,500	1.53	0.27	0.148	80.6	19.4	11.3	81.1	12*	9.22
Fir	73.41	3.45	20.63	1.26	6,210	1.52	0.215	0.131	84.7	15.3	8.1	52.3	10†	7.96

* Good pine charcoal. † Bad pine charcoal.

D. K. Clark gives somewhat different values from the above for the specific gravity of heaped charcoal. They are as follows: Oak and beech, 0.24 to 0.25; birch, 0.22 to 0.23; pine, 0.20 to 0.21. He gives the respective weights per cubic foot as 15 to 15.6 pounds, 13.7 to 14.3 pounds and 12.5 to 13.1 pounds, respectively. It is quite possible that both sets of figures are correct. The difference may be accounted for by the varying density of the wood employed, which was evidently obtained from different timber zones and had grown under different climatic conditions. The wood used for the charcoal quoted in the above table came from the forests on the eastern slope of the Ural Mountains, while that which served for the data in Clark's pocket book was undoubtedly of European, possibly English or Scotch, growth. It is true the latitude of these districts is very nearly the same, but while the one approaches the Siberian cold, the other receives the warming influence of the Gulf Stream, and there is no doubt that trees growing under such widely different conditions will produce wood of different density.

The A. Leschen & Sons Rope Company, St. Louis, Mo., enjoys the distinction of the selection of its rope as a portion of the equipment of the Peary Arctic expedition. The company is distributing a copy of a letter from Lieut. Peary ordering two hawsers ¾ and ½ inch in diameter of its patent flattened strand Hercules wire rope to be shipped to the Roosevelt, which is now on its way to the Arctic regions.

The world's gold production, which from 1881 to 1888 was nearly stationary at an annual total of a little more than $100,000,000, has since the latter date advanced rapidly. In 1892 it was $145,000,000; in 1896, $203,000,000; in 1898, $290,000,000, and in 1904, $359,000,000. Since 1882 there have been only two years in which the production was less than in a preceding year, those two being 1900 and 1901, due to the war in South Africa. Recovery was made in 1902, in which the production was very close to that in 1899.

THE IRON AGE

1855—1905.

New York, Thursday, August 31, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
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RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR

H. H. Roberts, who has been identified with the David Williams Company for 18 years, has resigned as manager of the Philadelphia office in order to engage in business on his own account.

We have appointed as manager of the Philadelphia office S. S. Reckefus, who has been connected with prominent technical journals for many years, both in the East and in the West.

The Charcoal Iron Industry.

When producers of Northern coke pig iron some years ago began to pay particular attention to the improvement of their foundry grades and particularly to the production of coke iron for malleable castings it was freely predicted that the end of charcoal pig iron manufacture was in sight. It was averred that the use of charcoal as a fuel gave pig iron no particular quality that could not be duplicated in coke iron, and that the latter would answer every purpose at considerably less cost. It may be recalled that the displacement of charcoal iron by coke iron became accentuated in the years following the panic of 1893, and it is more than a coincidence that these years witnessed the organization of foundrymen's associations throughout the country and the introduction of scientific study in foundry practice, with the knowledge that chemical analysis gave of the elements desired in pig iron to produce certain results. The necessity of crowding cost down to the lowest point led to a breaking away from traditions, and names and brands counted less than ever.

The manufacturers of charcoal pig iron, moreover, had moved along in well fixed lines for many years, and the antiquated conditions under which some charcoal irons were made gave large variations in product. It was natural that such irons would suffer by comparison with coke irons manufactured under the more scientific methods the manufacturers of the latter were beginning to employ to meet the specifications of progressive foundrymen. Such of the manufacturers of charcoal iron as heeded the warning and made a more careful study of their furnace operations and the resultant metal saw the possibilities not only of saving their industry from extinction but even of developing it to larger proportions. As the result of their efforts it was found that if this iron were made for special purposes there would be a steady demand for it, and that with proper cultivation the lines to which it was especially adapted would increase in number. The experience of the past few years appears to have justified the faith of those who took hold of the industry when it was at low ebb. There are in the United States to-day the largest and best equipped charcoal furnaces in the world, at which latter-day requirements as to product are carefully studied and met. Some new furnaces of this type have entered the field in the past few years and further furnace building is under way.

Chilled car wheel manufacture has been for years the most important field for charcoal iron. As the demands upon the car wheel foundry have been increasing, particularly with the common use of cars of 100,000 pounds capacity, the requirements as to pig iron have necessarily become more exacting. With a dead weight of over 18,000 pounds on each of the eight wheels of a modern freight car there have come changes in wheel design and an increase of weight, and along with these a call for high grade irons. The more recent agitation for even better wheels and the advocacy in some quarters of the steel wheel have in turn brought a new demand from the car wheel manufacturer for iron that will permit his product to stand up under the severest tests. The future of the cast iron car wheel will depend on the extent to which charcoal iron manufacturers and the manufacturers of car wheels keep pace with the requirements for a safe, long lived and yet economical wheel.

The malleable castings field, once monopolized by charcoal iron, swung over to coke iron when the industry outgrew the production of charcoal iron and "malleable Bessemer" pig iron has become a specialty with a number of progressive furnace companies in the Central West. The larger malleable castings are now made almost entirely from coke irons, which have found their way to a very considerable extent also into agricultural implement and stove malleables. However, charcoal iron is still bought to a considerable extent by those manufacturers of the lighter and medium weight malleables, whose requirements include low silicon and low sulphur for castings in which strength and rigidity are wanted. Where steel has not supplanted iron for car castings and couplers charcoal iron malleables are still manufactured.

The chilled roll industry still depends very largely upon charcoal iron, and special grading for this work and good chilling qualities have been the study of the charcoal iron furnaceman. Cylinders for steam and gas engines, with the high pressures in use to-day, are largely of charcoal iron, the requirement being for a particularly strong metal that will give dense, hard castings and be sufficiently fluid to run small work. The charcoal iron so used has a dense fracture, is high in manganese and has sufficient phosphorus to overcome the sluggishness due to density. It has been in increasing demand for this service. Other special charcoal irons have been made in recent years, including low phosphorus iron for acid and high phosphorus iron for basic steel. The call for charcoal iron blooms has increased also from works rolling iron sheet and tin plate bars. Charcoal iron boiler tubes call for a steady tonnage, as do bars for chain to meet Government and other special service requirements.

The conditions above outlined form the basis of the charcoal iron industry in the United States to-day, which is largely the result of the intelligent cultivation it has had in the past ten years. As is well known, the development of the by-products of the charcoal kiln is an increasingly important factor in the charcoal iron industry of the Lake Superior country. This, with the fact that these furnaces have close at hand the entire ore resources of the Lake Superior ranges and the abundant forest reserves of the upper peninsula, explains the special vitality of charcoal iron manufacture in that district, in which it has had so long a history. The variety and richness of the lake ores have lent themselves particularly to the latter day study of special applications of charcoal iron, in which the manufacturer has had the help of the chemist and metallurgist. It will be interesting in this connection to note how the percentage of Lake Superior charcoal iron has increased. In the following table five-year intervals are shown up

to 1900, and after that year the production is given for each year:

Comparison of Lake Superior Charcoal Iron Production with the Total for the United States.—Gross Tons.

	Total charcoal pig iron.	Total Michigan and Wisconsin.	Per cent. Michigan and Wisconsin.
1885	357,004	145,312	40.7
1890	628,145	315,615	50.2
1895	225,341	137,179	60.9
1900	339,874	207,497*	61
1901	360,147	220,257*	61.1
1902	378,504	210,911†	55.7
1903	504,757	305,072†	60.4
1904	337,529	223,318*	66

* Including small amount in Missouri.
† Including small amount in Missouri and Washington.

It will be interesting also in this connection to note the fluctuations in the production and consumption of charcoal iron in the United States in the years following 1860. Five-year intervals are represented up to 1890, after which the production is given year by year:

Production and Consumption of Charcoal Pig Iron in the United States.—Gross Tons.

	Production.	Stocks. + Increase. — Decrease.	Apparent consumption.
1860	248,510	.....	.....
1865	234,234	.....	.....
1870	325,893	.....	.....
1875	366,956	— 9,634	376,590
1880	479,963	+ 27,278	452,685
1885	357,004	+ 9,098	347,006
1890	628,145	+ 56,483	571,662
1891	576,964	+ 55,795	521,169
1892	537,621	— 39,799	577,420
1893	386,789	+ 33,695	353,094
1894	222,422	+ 43,002	179,420
1895	225,341	— 115,150	340,491
1896	310,244	+ 58,001	252,243
1897	255,211	+ 16,761	238,450
1898	296,750	— 118,153	414,903
1899	284,766	— 79,849	364,615
1900	339,874	+ 50,785	289,089
1901	360,147	— 46,628	406,775
1902	378,504	— 8,724	387,228
1903	504,757	+ 113,430	391,327
1904	337,529	+ 19,847	317,682

The three years preceding the panic of 1893 showed the greatest production of charcoal iron in any three-year period in the history of the industry. In the succeeding years of low prices in the iron trade the inroad of coke iron was most marked. Charcoal iron consumption rallied in 1895, when the demand for all irons was temporarily greater than the supply. It fell away again in 1896 and 1897, and on the revival in iron in 1898 took a stronger place in the producing column, from which it has made a gradual advance, barring the setback of last year. It would appear that the position of the progressive makers of charcoal iron is more secure to-day than at any time since the competition of coke iron was first seriously felt. The field of special uses for their product has been increased as a reward for the painstaking work of the past seven or eight years; and when it comes to a pinch owners of the most modern charcoal furnaces, with their by-product plants, seem to feel that they will not necessarily be driven out if the test must be made for a time on the basis of price alone.

Strong evidence of the crowded condition of the rail mills is afforded by the growing demand for relaying rails. Whenever new rails can be promptly supplied by the rail mills the market for relaying rails is slow and the supply accumulates. At present a heavy demand is found for relaying rails throughout the greater part of the country. Buyers of rails who desire small quantities for short pieces of track, being unable to secure attention to such orders from the rail mills, are now taking relaying rails with alacrity. The consequence is that relaying rails are rapidly passing from the possession of those who have long been holding them, and the price has risen fully $3 per ton within the past six weeks.

The Question of Self Insurance.

The experiment of substituting self insurance for that of the fire insurance companies has been tried and has been found wanting as a general business principle, excepting in certain instances, which prove the rule. Some years ago not a few manufacturers, smarting under what they considered exorbitant insurance rates, surrendered their policies and substituted for them a fund based upon the money which had previously been paid in premiums and its accumulations. It was a good scheme provided there were no fires, but instances occurred when the fire for which the fund was supposed to provide came before it had grown to any sort of proportions, which meant an almost total loss. To put it plainly, the system proved to be a game of chance. By some manufacturers it is still considered a good method of insurance, but these instances are where there have been no fires. The element of insurance, as the word is usually understood, is missing.

Various concerns have abandoned the system, reverting to straight fire insurance or to the mutual plan, which has worked out very well in most lines of manufacture where it has been specialized and confined to a class of industry. Modern fire protection is in part responsible for the change, particularly the introduction of automatic sprinklers, for they have reduced insurance rates to as low as 25 cents per $1000 risk. The United States Steel Corporation does its own fire insurance, and this is one of the instances where the system may work out with excellent results. Where there are a great number of plants, and the total insurance bill mounts into large sums of money annually, the fund may well be accumulated, each year's contribution being sufficient to pay at least one heavy loss or a number of small losses. The chances of a coincidence of a number of serious fires which will more than wipe out the fund are not great. But the element of chance is still present. There might be a series of great fires among such a company's plants, which would mean a serious deficit in its insurance fund. On the other hand, the fund might grow to great proportions because costly fires were few and far between. At any rate, the eggs are not all in the same basket, which is the case with smaller manufacturing establishments whose entire resources are centered under a single roof or within a group of buildings closely adjacent to one another.

Occasionally there is a risk so great that the insurance bill is a real burden, as, for instance, a wood working establishment, where there is an accumulation of shavings and sawdust, even if modern methods are employed to take away the *débris* of manufacture by mechanical collectors. In such instances the insurance fund may prove to be a wise method of protection. But the rule is pretty well established, taking the average experience as the basis, that the manufacturer is best off who equips his buildings with the best of protection, such as sprinklers and devices for quick action to extinguish incipient blazes, and takes the low rates of insurance which prevail under those conditions.

The fire insurance companies are often criticised for their arbitrary rules regarding fire protection. The manufacturer may resent the cost of fire doors, sprinklers and other safeguards. But he must enjoy the decreased insurance bills which compliance with these requirements brings about. It is no uncommon matter to see an insur-

ance bill reduced to a sixth part of what it had been all because of the investment in fire protective measures. The manufacturer may add to his safety by a fire drill with emergency apparatus, such as the common extinguishers. Under these conditions the adoption of the insurance fund could hardly pay under any circumstances, for, excepting in cases of excessive risks, the manufacturer could not hope to see the fund grow to an amount equal to the value of the property at stake within his natural lifetime.

The Manufacture of Denaturized Alcohol.

The active campaign now being carried on by the National Association of Automobile Manufacturers and by manufacturers in other lines for the abolition of the tax on denaturized alcohol lends interest to a report recently received at Washington from Consul-General Frank H. Mason of Berlin. In *The Iron Age* of July 20 the arguments presented by manufacturers in support of their proposition for the removal of the tax were summarized in our Washington correspondence. Consul-General Mason writes as follows concerning the alcohol industry in Germany:

The official statistics of last year's campaign—viz., from September 1, 1903, to August 31, 1904—give the following as the total output of alcohol from each of the three principal raw materials during the year:

	Hectoliters.
From potatoes	3,045,605
From grains	692,483
From beet molasses	116,211
Total	3,854,299

This total is equal to 101,823,470 gallons.

The spirits distilled from grain and molasses and the small quantities made from cherries, grape-must, plums, &c., are used mainly for drinking and the manufacture of medicines, perfumes, vinegar and various other food preparations. The great source of industrial alcohol is from potatoes, and it is used for heating, lighting and motor purposes and for a vast number of applications in chemical and industrial manufactures. The consumption of alcohol in Germany as fuel for portable and stationary engines, automobiles, &c., has decreased rather than increased the past two years, and amounted during the last campaign year to not more than 951,000 gallons, or less than 1 per cent. of the whole alcohol product of the same year.

For most industrial purposes alcohol is used in Germany duty free, after having been "denaturized," or rendered unfit for drinking purposes by admixture in presence of a Government official with a prescribed percentage or proportion of one or more of several different substances prescribed in the very elaborate statute which governs that complicated subject in this country. There are two general classes or degrees of denaturizing—namely, the "complete" and the "incomplete," according to the purpose for which the alcohol so denaturized is to be ultimately used.

German Methods of Denaturizing.

1. Complete denaturization by the German system is accomplished by the addition to every 100 liters (equal to 26½ gallons) of spirits of:

(*a*) Two and one-half liters of the "standard denaturizer," made of 4 parts of wood alcohol, 1 part of pyridin (a nitrogenous base obtained by distilling bone oil or coal tar), with the addition of 50 grams to each liter of oil of lavender or rosemary.

(*b*) One and one-fourth liters of the above "standard" and 2 liters of benzol with every 100 liters of alcohol.

Of alcohol thus completely denaturized there was used in Germany during the campaign year 1903-1904 931,406 hl. denaturized by process *a* as described above, and 52,764 hl. which had been denaturized by process *b*. This made a total of 26,080,505 gallons of wholly denaturized spirits used during the year for heating, lighting and various processes of manufacture.

2. Incomplete denaturization—*i. e.*, sufficient to prevent alcohol from being drank, but not to disqualify it for use for various special purposes, for which the wholly denaturized spirits would be unavailable—is accomplished by several methods, as follows, the quantity and nature of each substance given being the prescribed dose for each 100 liters (26½ gallons) of spirits:

(*c*) Five liters of wood alcohol or ½ liter of pyridin.

(*d*) Twenty liters of solution of shellac, containing 1 part gum to 2 parts alcohol of 90 per cent. purity. Alcohol for the manufacture of celluloid and pegamoid is denaturized—

(*e*) By the addition of 1 kg. of camphor or 2 liters oil of turpentine or ½ liter benzol to each 100 liters of spirits. Alcohol to be used in the manufacture of ethers, aldehyde, agarcin, white lead, bromosilver gelatins, photographic papers and plates, electrode plates, collodion, salicylic acid and salts, aniline chemistry and a great number of other purposes, is denaturized by the addition of—

(*f*) Ten liters sulphuric ether, or 1 liter of benzol, or ½ liter oil of turpentine, or 0.025 liter of animal oil

For the manufacture of varnishes and inks alcohol is denaturized by the addition of oil of turpentine or animal oil, and for the production of soda soaps by the addition of 1 kg. of castor oil. Alcohol for the production of lanolin is prepared by adding 5 liters of benzine to each hectoliter of spirits.

The whole amount of incompletely denaturized alcohol of the several grades above described which was consumed in Germany last year was 385,946 hl., equal to 10,227,569 gallons. In addition to all the foregoing, 21,779 hl. of alcohol was used duty free and without denaturization of any kind for Governmental or public purposes, such as hospitals, Government laboratories and for the manufacture of fulminates and smokeless powder.

Cost of Production.

The cost of manufacture of alcohol in Germany varies in the different States and provinces of the Empire, and still more from year to year, in accordance with the yield and consequent market price of potatoes, grains and other materials. In Prussia during the past year the wholesale price of fully denaturized spirits of 90 to 95 per cent. strength has ranged from 35 to 50 pfennigs per liter, which would be from $8.56 to $11.90 per hectoliter of 26½ gallons—say, 32.3 to 45 cents per gallon. This was a marked advance over the prices of the campaign years 1901-1902 and 1902-1903, when by reason of the enormous potato crop and consequent overproduction of spirits in 1901 the open market rate for denaturized alcohol of the grade used for motor purposes declined to 15 and 17 cents per gallon, but has now risen to from 31½ to 35 cents per gallon for the same quality.

It goes without saying that much of the alcohol sold for the prices of 1901, 1902 and 1903 brought to the producer the bare cost of manufacture, or even less, whereas the industry is now, generally speaking, profitable and prosperous. Alcohol as a fuel for motors requires for the best results an admixture of from 15 to 30 per cent. of benzol, and at the present cost of denaturized spirits is no longer an economical motor fuel in Germany.

The New England Foundrymen's Association had the second of its summer outings from Providence, R. I., August 22, under the guidance of Providence members, headed by A. J. Miller, Jr., who took personal charge of the arrangements, with a most fortunate and enjoyable result. The day was perfect. The large party sailed from Providence on the steamer Pontiac, arriving at Boyden's Heights in time for a genuine Rhode Island clambake at noon, after which there was a sail down Narragansett Bay to Newport, where the battle ship squadron was at anchor, affording a fine spectacle. Supper was served on the boat during the return trip to Providence. A stop was made at Rocky Point, where some of the members of the party left the boat to look over that pleasure ground. It was one of the best enjoyed of the outings of the association.

Ore Leases Attacked by Minnesota.

DULUTH, MINN., August 26, 1905.—Next week, before the District Court of St. Louis County, a beginning is to be made of the case of the State of Minnesota against the holders of mineral leases and contracts. The merits of this action and the probability of its beginning were briefly discussed in *The Iron Age* about two months ago, but I must confess that at that time I never dreamed that the State would ever so stultify itself as to press the case. The whole action rises out of a complicated law suit over a miserable little sliver of land north of the Alpena mine, which had been left out of surveys and was for a time a "no-man's land." This sliver runs along the north side of the western part of T. 58, R. 17, and is about 650 feet wide at its extreme width. It probably carries ore, although no exploration has yet been done to prove this. The Alpena ore body comes close to the line from the south, but exploration just to the north side has been rather unfavorable. When it was found that there was a strip of land there yet unowned by any one it was squatted on by parties who expected to claim it under the United States land laws, and the State of Minnesota demanded it as swamp land under the organic act. The matter has grown more and more complicated as time has passed and new facts have come into the case, and the fabled value of the tract has grown with each new phase of the struggle to obtain it. The State in seeking some way to obtain the land ran against a technicality as to all mineral leases and is now in the position of the bird which fouls its own nest. The State constitution distinctly states that no land shall be sold by the Commonwealth except at public auction. The contention of the State's officials now is that mineral leases are in effect a sale of the land, a disposition of the fee title, and that they have been carried on contrary to the constitution. There is no question that these leases have not been disposed of at public sale, if by that term is meant the actual auctioning off of tracts. But they have been sold to the first comers in a public manner, and any one who has wanted a lease has been able to go into the State Land Department and, on compliance with the provisions of the special law governing their disposal, to get any lease not already issued. The method of disposition of State mineral land has been governed by an act of the Legislature passed in 1889, when it seemed impossible that these lands could get into the hands of the public and under development in any other way.

Any man posted on the recent history of the Mesaba range and equipped with figures as to the cost of exploration and development can readily figure out, say, 100 State leases and contracts that have cost the present holders not less than $2,500,000. And this by no means covers all these tracts. The gross sum that has been spent in their purchase, including State fees and taxes, bonuses to prior holders and exploration costs, can hardly be less than $4,000,000. Of course all this will be wiped out if the State wins in its effort to prove that its mineral lease law is unconstitutional. Perhaps as much more has been spent by holders of leases in developing them into mines, sinking shafts and driving drifts, stripping the surface and equipping the properties. All of this will also be lost to those who have paid it if the law is found illegal. There is no case on the Mesaba range where the present owner of a lease has taken out enough ore to repay him for the cost of development of his property, for it takes years to recoup the vast expenditures necessary in opening a mine. The taking back of these lands, to be thrown open later to the highest bidder for cash, would be confiscation on a grand scale and hardly equaled in recent history. The question of royalty rates would also be opened and the State would reserve to itself the power to revise present schedules. All State lands are now leased at a rate of 25 cents per ton.

Mining News.

Corrigan, McKinney & Co., who have operated the Crystal Falls mine since they took a lease there 10 or 11 years ago for $5000, are to continue in charge, details of the extension of their lease having been closed. The mine will be developed on a larger scale than for some time, and will be again made a large and important producer. It is a large property for an old range mine and produces a good high phosphorus ore. This concern is working extensively in the Crystal Falls district and is making a production there of from 500,000 to 600,000 tons a year.

The Duluth, Missabe & Northern Railroad is busily engaged in the construction of its new road to the western Mesaba and a thousand men are scattered along the proposed route. The plan has been to mine not much less than 1,000,000 tons there in 1906, but it now seems as though this would be a physical impossibility. Development is proceeding with great speed, but the mines are some distance from any railroad, and their exploitation is attended with unusual difficulties, for they are all underground, are very wet, and the ores must be concentrated, for which purpose special machinery must be provided. The Duluth, Missabe & Northern is now equipped with rolling stock and terminal facilities for the ready delivery to ships of fully 1,500,000 gross tons per month, or an average of 50,000 tons daily. But if this western Mesaba is what is hoped for it and the conditions of the Canisteo leases are maintained there must be additional equipment. If the coming year shows promise as rich as is hoped it is quite probable that the road will be forced to erect a new and large shipping pier. In that case it is not improbable that No. 1 dock, built in 1893 and then a model of size and capacity, may be wrecked. It is 53 feet high, which is not enough for the modern lake carrier, though ample ten years ago for the largest craft that sailed the great lakes. Ships are now so high out of water that no new docks less than 65 to 70 feet high are considered. With less hight than that the bottom of pockets is so near the water that there is no way of getting ore to slide out when the chutes are lowered over the hatches; in fact, the bottom of the pocket will often be on a level with or lower than the deck of an empty ship. With a continuation of good business for a couple of years the Duluth, Missabe & Northern should handle a monthly ore traffic of about 2,000,000 gross tons and earn gross therefrom about $1,600,000. The general opinion is that more than 50 per cent. of the gross earnings of this road are net.

The development of Sturgeon Falls of the Menominee River for power for operating the mines of the Penn Iron Mining Company (Cambria Steel Company), which has been referred to in this correspondence as pending, is now assured. It is to be undertaken at once. The work will cost about $250,000, and a minimum horse-power of 2400 is to be developed. The dam will be built before next spring. It is almost precisely five miles from the most distant mine of the company to these falls, which latter present a most favorable location for a high dam impounding a large volume of water, for at the site of this dam the stream is very narrow and the banks rise sharply about 80 feet. No contract for electrical machinery has yet been let.

The Lake mine of the Cleveland Cliffs Iron Company at Ishpeming is to be equipped electrically underground at once and contracts have been made with the General Electric Company for the work. The equipment includes a 105-kw. generator and five tramming locomotives. The greater share of the mine's tonnage will be handled by this plant. The company has just come into possession of water power good for about 1500 horse-power, and the immediate improvement of this is now under serious consideration. Some very important electrical mine equipment contracts will probably be ready for announcement the coming week.

Strikers at Newport and Bonnie mines, Gogebic range, have returned to work and the mines are making the usual production. D. E. W.

The block system of railroad signals, which was considered an experiment only a few years ago, is about to become a general appliance on all important railroads, and the *Railway Age* predicts that every railroad in the country will be using the signals within a few years. Manufacturers of the necessary apparatus are very busy, with probably a year's work assured by orders now in hand.

An Important Trademark Ruling.

WASHINGTON, D. C., August 28, 1905.—The Commissioner of Patents has made a comprehensive ruling with regard to the provisions of section 5 of the new Trademark act, which prohibits the registration of a mark that "so nearly resembles a registered or known trademark owned and in use by another, and appropriated to merchandise of the same descriptive properties, as to be likely to cause confusion or mistake in the mind of the public or to deceive purchasers." The case arose upon the application of a manufacturer for the registration of a trademark consisting of a Maltese cross formed of a small black outline which the Examiner of Trademarks rejected because of the prior registration for the same class of goods of a Maltese cross with a solid background on which is displayed a monogram in a circle. In sustaining the ruling of the examiner the Patent Commissioner says:

"The appellant argues that its mark should be registered because of differences between it and the previously registered mark. The registered mark does not contain a monogram or printed words, but is a plain Maltese cross made up of black lines. The appellant says that 'the office should recognize that a mere outline cross is not the same as a solid color cross with a distinctive monogram at its center and should not attempt to override the evidence of the eyes that appellant's mark is not the same as the registrant's mark, showing merely an outline of a cross with an open center.'

"It is further said that the question raised by this office is really one of infringement, and that 'this question is for the courts to determine, and the Patent Office should not refuse registration where the applicant's mark is prominently and distinctively different from the prior registered mark.'

"Section 5 of the act of February 20, 1905, provides that marks shall not be registered 'which so nearly resemble a registered or known trademark owned and in use by another, and appropriated to merchandise of the same descriptive properties, as to be likely to cause confusion or mistake in the mind of the public, or to deceive purchasers.'

"Under this statute it is clearly the duty of this office to refuse registration whenever in its opinion the applicant's mark so nearly resembles a prior registered mark as to mislead purchasers as to the origin or ownership of the goods upon which the two marks are used. It is not necessary that the marks be identical, but only that there be such resemblance as to be likely to lead parties to purchase the goods of the applicant, supposing them to be goods produced by the registrant.

Essential Feature of the Mark Controls.

"In the present case the Maltese cross is the thing which would attract the attention of purchasers in the appellant's mark as well as in the registered mark. The features which the appellant has added to the registered mark are not such as would prevent confusion between the two marks. Purchasers would be likely to regard them as features added by the registrant to his mark rather than as the independent mark of a different manufacturer, even if they remembered that the registered mark did not include them.

"In Bass, Ratcliff & Gretton *vs.* Christian Feigenspan (96 Fed. Rep., 206), the Circuit Court had before it the question whether a mark consisting of a plain triangle was infringed by a mark consisting of a triangle made up in a particular way, and having a monogram and scroll therein, and it was said:

"'These two symbols, dissociated from all accessories on labels or capsules bearing them, resemble each other closely enough to be confusing, deceptive and misleading to the public, if both be applied to substantially malt liquors. The essential feature of the defendant's symbol is not the monogram or gold border or scroll ornamentation. That feature is the triangle, or, as it has been applied, the red triangle, which also constitutes the complainant's symbol as employed in connection with the sale of bottled pale ale. There is nothing particularly unique or striking in the monogram, and, if there were, it might be readily supposed to represent, not that the malt liquor to which it is applied was the product of some person, firm or corporation other than the complainant, but merely the initials of the name of some bottler of, or agent for, Bass pale ale. Neither the gold border nor the scroll tracing is calculated to stamp itself upon the memory comparably with the triangle.'

"The analogy of that case to the present is apparent. The decision of the Examiner of Trademarks refusing registration is affirmed." W. L. C.

The mechanical plant of the new Baltimore *American* Building, just erected to take the place of the one destroyed by the great fire of 18 months ago, includes two 150-kw. Curtis turbo-generating units and about 50 electric motors of various sizes. The two boilers are of the marine type, of 150 horse-power each, and have corrugated furnaces. An air compressor for supplying air hoists designed for the transfer of the large rolls of paper to the printing presses is driven by chain from a 30 horse-power motor. This compressor has a capacity of 170 cubic feet of air per minute, and among the other uses to which it is put are those of forcing ink to the presses and operating a pneumatic tube system. The two Hoe presses have each an hourly capacity of 200,000 12-page papers. The two pumps have each a capacity of 300 gallons of water per minute.

A new type of furnace to abolish black smoke, no matter what the fuel burned in it, has been tried in London. The innovation consists in a screen of fire bricks, tubular in form, built up in the furnace in such a position that all of the products of combustion must pass through it on their way to the chimney. This screen quickly becomes incandescent and consumes all combustible gases as they pass through it, denuding the final smoke of carbon bearing elements and improving the general efficiency of the plant. For the purpose of the demonstration cheap damp coal dust was burned. The first result was a light cloud of gray smoke, which disappeared within a few seconds as the screen reached an incandescent heat. It is said that coal of the very worst description can be burned without smoke in an ordinary furnace fitted with this device.

Immense deposits of almost pure sulphur occur in Louisiana, but they are hard to reach because of a thick overlying stratum of quicksand, which defies all efforts at shaft sinking. The Standard Oil Company adopted a most ingenious plan for obtaining the sulphur, which is worth $28 per ton at the wells. A number of 4-inch tubes were sunk into the sulphur deposit and then steam from a large battery of boilers was turned into a part of the tubes. The heat of the steam was sufficient to soften the sulphur to such an extent that it was forced by the pressure to flow up through the other tubes, whence it was run into tanks in a semiliquid mass and allowed to cool. When cooled it is broken up into lumps for shipment.

Tests of a Yarrow water tube boiler on the new English armored cruiser Warrior gave an equivalent evaporation "from and at 212 degrees" of 11.66 pounds of water per pound of fuel when the rate of combustion was 24 pounds of fuel per square foot of grate per hour; at 36 pounds per square foot the evaporation was 10.97 pounds of water, and at 48 pounds the evaporation was 11.04 pounds per pound of coal. The figures for evaporation per square foot of heating surface under the three conditions mentioned were, respectively, 4.72, 6.65 and 8.93 pounds per hour. The boiler has a grate area of 53 1-3 square feet and a total heating surface of 3163 square feet.

The first annual Territorial fair of Arizona will be held at Phœnix, Ariz., December 4 to 9, inclusive, by the Arizona Territorial Fair Commission, Vernon L. Clark, superintendent. It is claimed to be a fine opportunity for merchants and manufacturers who have established trades in the Territory to make an exhibition of their goods.

Terne Plates for Tin Roofing.

At the convention of the National Association of Master Sheet Metal Workers in Milwaukee President Edwin L. Seabrook invited Wm. U. Follansbee of the Follansbee Bros. Company to join in the discussion of the paper, "Terne Plates for Tin Roofing," presented by William Martin. As Mr. Follansbee was not aware that he would be called on, his remarks were entirely impromptu, and he was given the privilege of revising them, and the revision is as follows:

It may surprise the members of the association to be told that notwithstanding adverse comments upon tin roofing, there are unquestionably to-day more roofing plates used than ever before. This is doubtless due to the recognition that for most buildings the tin roof is the ideal one.

It is also unquestionably true that were it not for the fact that occasionally a tin roof "goes bad" from pin holing the use of tin plate for roofing would be very greatly increased to the decided advantage of all metal workers.

It is only proper to here state much injury has been done to the cause of good tin roofing by the use of improper paints, which not only fail to protect, but actually destroy the plate.

The trade is very familiar with the claims put forth in advocacy of the merits of different brands, and has naturally wearied of statements respecting the number of pounds of coating, the process of tinning, &c.

Of late in recollection of plates of many years ago having been manufactured of an iron base there has been much talk of charcoal iron. This doubtless results from entirely overlooking the fact that selected soft steel as a base for tin plates has been used almost exclusively by the Welsh manufacturers since about 1875, and that it was because of the great superiority of this selected soft steel over charcoal iron that tin roofing experienced the greatest growth in its history during the years 1885 to 1895.

It is well known that there are thousands and thousands of tin roofs all over this country put on of imported Welsh steel plates that have lasted perfectly for 20 years, with every prospect of being good for an indefinite number of years to come.

Unfortunately there is no one single cause for the pin holing difficulty. The process of tin plate manufacture is lengthy, requiring a period of three weeks from the time the bar is cut ready for heating until the finished sheets are boxed ready for shipment. The process of manufacture embraces some forty different operations during which the sheets necessarily pass through many different hands.

Many of the different stages of manufacture are of vital importance to the lasting quality of the plate, and errors in any one of these operations may be fatal to the life of the plate. This is particularly true of the pickling, annealing and tinning stages of manufacture; and irrespective of the base being iron or steel, if each of these steps is not conducted properly the wearing quality of the plate upon the roof will be influenced. The careful selection of material for the base of the plate is not the only requisite. Equal care should be exercised in the selection of the palm oil, block tin, lead, &c., particularly avoiding cheap mixed metals containing antimony.

That the production of so-called charcoal iron plates will not remedy the pin holing difficulty is already being most emphatically demonstrated in that charcoal iron plates of comparatively recent American manufacture are already proving defective in at least equal proportion to steel plates, taking into consideration the respective quantities of each used.

From what has been stated it can be seen it is not the use of any one particular material nor care in any one of the forty odd stages in manufacture entering into the finished plate, but the proper and intelligent control of all these features. In other words, gentlemen, it is experience properly and honestly applied that makes the perfect and lasting roofing plate.

The Welsh thoroughly understand this principle. They have been born and bred in the industry. They have been taught religiously that bad work in every stage of the manufacture is a crime. They have produced good and lasting plates from charcoal iron, and have and are producing better and more lasting plates from selected soft steel.

Unfortunately for the cause of good tin roofing probably 90 per cent. of all tin plate is used in the manufacture of cans, for which the quality requirements are almost nothing, the can necessarily being destroyed when the contents are used. It is comparatively easy to learn how to make tin plate required for canning purposes. Such workmen, however, are by no means competent to produce either high grade roofing or high grade bright tin plate.

The day has come when the roofing trade should demand and manufacturers should furnish roofing tin plate for which, under reasonable conditions of painting and workmanship, a definite and specific guarantee of wearing quality for a period of years shall be given. Such plate should of course be stamped with the name of the manufacturer and the year of manufacture. This will put the responsibility where it rightfully belongs, upon the manufacturer, will necessitate the proper care and intelligent attention to the selection of all raw material and every detail of manufacture, and will place the tin roofing industry upon the high plane to which it properly belongs and will redound to the lasting advantage of the entire industry.

NEWS OF THE WORKS.

Iron and Steel.

It is announced from Lynchburg, Va., that the Virginia Iron, Coal & Coke Company contemplates enlarging its furnace at Radford, Va., so that it will have a daily capacity of 200 tons instead of 150. The company, it is stated, will also build a 200-ton furnace at the same place.

The Prouty Wire Company, Charlton, Mass., formerly manufacturer of fine wires, has filed a petition for dissolution. George E. Prouty, Charlton, is the sole owner of the business.

The Sylvesta Company, Boston, is adding to its Danversport Iron Works at Danversport, Mass., three new scrap heating furnaces, one 18-inch roughing mill, one stack, three boilers an engine, shears, new scrap shed, &c. The works, which have been closed for about three weeks for these alterations and repairs, will start up again about September 15. The company makes bar iron, railroad and ship spikes, bolts, forgings, &c.

At the Shenango works of the American Sheet & Tin Plate Company, New Castle, Pa., 20 of the 30 hot mills have been started and the other ten will be started in a short time. This plant has been idle nearly two months while extensive repairs were being made.

The plant of the Eleanor Iron & Steel Company, near Irwin, Pa., has been sold to the Liberty National Bank of Pittsburgh for $200, the sale being made subject to mortgages of about $100,000. The plant has not been operated for a long time, and when in operation turned out skelp and iron bars.

Fannie Furnace of the Cherry Valley Iron Company, at West Middlesex, Pa., has resumed blast after being relined and extensively repaired.

The Shenango Furnace Company, Pittsburgh, has blown out its No. 3 stack at Sharpsville, Pa., for relining and repairs.

The plant of the Independent Steel & Wire Company, 73-83 North Ashland avenue, Chicago, was totally destroyed by fire August 21, the loss occasioned being approximately $100,000, which is fully covered by insurance. The company makes agricultural implements, railroad and other kinds of springs, and in addition to the works at Chicago is just completing a new plant at Monessen, Pa., which can shortly be called on to relieve any delays in execution of business which would otherwise arise from the fire at the Chicago plant. William A. Hirsh is president of the corporation and Arthur Hirsh is its treasurer. Arrangements for rebuilding have not been fully completed, but the company expects to conduct at least a small factory in Chicago for the prompt handling of orders in Western territory. The greater part of the manufacturing will probably be done at the Monessen plant.

The Wisconsin Steel Company, North Freedom, has filed articles of incorporation at Madison, Wis., with $1,000,000 capital stock. The new company will develop large iron ore holdings at North Freedom. B. K. Miller, Jr., of the law firm of Miller, Noyes & Miller is the principal incorporator.

At the Vandegrift works of the American Sheet & Tin Plate Company, Vandegrift, Pa., 21 of the 29 hot mills have been closed

down temporarily, but are expected to be started again within a very short time.

General Machinery.

The Robins Conveying Belt Company, New York, has on hand at present among its various contracts an order for a 1-ton mast and gaff rig for the Forty-fourth street station of the Consolidated Gas Company, New York. It is also about to complete an order for separator parts for the Elizabeth Copper Company, Stafford, Vt., and is preparing plans for new improvements at the Newark Works of the National Metallurgical Company.

The Zillox-Green Company, capitalized at $6000, has been incorporated at Buffalo, N. Y., to deal in machinery. Directors: Jno. Zillox, H. L. Green, Albert Zillox, Robert Stedler and Louis F. Schlager.

The front building of the Charles Holmes Machine Company, East Boston, Mass., which was recently almost totally destroyed by fire, is to be rebuilt on a larger scale. The new building will be a two-story structure, the lower floor being 75 x 150 feet, 50 feet longer than the burned building, and the second floor 75 x 100 feet. A new two-story building, 30 x 45 feet, will also be constructed further out on the pier. The company is now adding gas producers for supplying its gas engines.

The Crossley Mfg. Company, Trenton, N. J., has prepared plans for an addition to its plant at East State and Monmouth streets. It will cost about $8000. This increase in capacity is necessitated by the large demand for clay working machinery.

The new machine shop of Edward B. Robertson, East Norwalk, Conn., is about completed and will be ready for installation of machinery about September 1. The shop will be equipped with 18 to 20 inch lathes, No. 2 milling machines, 24-inch drill presses and other up to date machine tools.

Power Plant Equipment.

The Hercules Gas Engine Works, at 215 to 231 Bay street, San Francisco, Cal., was destroyed by fire August 13. The building was 200 x 280 feet and contained machine shop, blacksmith shop, pattern shop, stockrooms, toolrooms and factory offices. The company has purchased property in a new location and is just closing contracts for new buildings which are expected to be ready for occupancy at a very early date. The new shop will be equipped with the latest improved machinery, providing greater facilities for turning out work than were afforded before the fire. During the course of construction of the new plant the company has made arrangements with other shops in the city to carry on its current orders and repair work.

W. E. Ritchie, contractor and builder, Oskaloosa, Iowa, has interested himself in the manufacture of tubular culverts made of galvanized iron and will establish a factory for this purpose. A stock company is to be organized with sufficient capital to operate a factory employing about a dozen men at the start. A part of the machinery required for the plant has been purchased and Mr. Ritchie is now in the market for an engine, either gasoline or steam, and a boiler of 25 or 30 horse-power.

The Clinton Electric Light Company, Clinton, Ind., has purchased and will install, in a new machine room to be built, two Westinghouse dynamos and one 150 horse-power Hamilton-Corliss engine.

The Cleveland Steam Boiler Works, Cleveland, Ohio, established 30 years ago by Daniel Connelly, has been incorporated under the name of the D. Connelly Boiler Company with a capital of $100,000. The incorporators are Daniel Connelly, M. Connelly, Lawrence E. Connelly, Kate Connelly and Christian C. Schafer. Mr. Schafer has been the superintendent of the works for several years.

Foundries.

The Allis-Chalmers Company, Milwaukee, Wis., has decided to reopen what is known as the south foundry, at Bay View, and will commence work at that plant September 1, giving employment to a large number of men.

The Bucyrus Steel Casting Company, Bucyrus, Ohio, has been incorporated by P. J. Carroll, George Donenwirth, J. B. Gromley, A. M. Rumer, R. V. Sears, W. A. Bilcke and Isaac Nussbaum. The company will erect a new steel building for the manufacture of steel castings. The capital stock of the company is $100,000.

The S. Obermayer Company, manufacturer of foundry supplies, has added to its Chicago plant a large wood working department, with special and improved machinery to facilitate the prompt shipment of flasks of all kinds.

J. Walter Miller, Lancaster, Pa., manufacturer of brass and bronze castings, metal finishing, &c., has leased his present quarters for another year and has postponed erecting his contemplated new buildings. The new foundry building, however, is now in operation and is working perfectly.

Bridges and Buildings.

Bids will be received until October 2 by W. T. Whiting, chairman of the special Bridge Committee, Peoria, Ill., for the construction of a steel or reinforced concrete bridge across the Illinois River at Bridge street, Peoria. A bridge with a roadway 40 feet wide and with a movable span having a clear opening of not less than 125 feet is specified, either revolving draw, bascule trunnion or lift type. It will serve not only wagon and foot traffic but a double track electric railway.

The American Bridge Company is erecting the steel superstructure for the machine shop of the Duluth, Missabe & Northern Railroad at Proctor, Minn. The shops will be completed October 15.

The Wisconsin Bridge & Iron Company, Milwaukee, Wis., has been awarded contract at $65,597 for building a swing bridge across Main street at Racine, Wis.

Fires.

The woolen mill of Daniel Curtiss, Woodbury, Conn., was destroyed by fire last week. The building was 50 x 100 feet and two stories. Loss $50,000.

The paper box factory of Jenks Bros., Providence, R. I., was destroyed August 25 by a fire which caused damage of $60,000.

The Putnam Mfg. Company, New London, Conn., manufacturer of furniture, suffered a loss of $35,000 by fire August 26.

The plant of Weir & Craig Mfg. Company, Chicago, Ill., was damaged $70,000 by fire last week.

The Michigan Washing Machine Company's plant at Muskegon, Mich., was partially destroyed by fire a few days ago. The loss is placed at $25,000.

Hardware.

F. E. Myers & Bro., Ashland, Ohio, endeavor to close their factory for three weeks to a month each year to make necessary repairs and give the workmen a needed rest, but this year they will not be able to close the foundry longer than one week and the machine shop two weeks, owing to the especially large demand for Myers pumps, hay tools, &c.

The Oriental Emery Company, manufacturer of pure Turkish emery, whose plant at Derby, Conn., was completely destroyed by fire on February 28 last, has resumed business at New Haven, Conn., in a brick factory where the company has floor space of about 20,000 square feet and located on both railroad and tidewater. This plant has been equipped with entirely new machinery especially adapted to the economical manufacture of the product. The greater part of the machinery is of special design, and the plant has a capacity of 6 tons per day. The ore, all of which is shipped to this company direct from Turkey, is landed at its own dock, adjoining the plant, and from the first crusher is carried automatically through the various machines, including a series of crushers, rolls, washers, graders, &c. A Nagel gas producer plant of 75 horse-power has been installed, also a Rathbun vertical multiple cylinder gas engine of 50 horse-power, an air compressor, Champion blower, also a heating plant for heating the building and drying the emery. The company is now prepared to furnish promptly all sizes of pure Turkish emery.

The Wm. Schollhorn Company, manufacturer of Bernard's patent pliers, nippers, punches and tools, New Haven, Conn., intends to erect an addition to its factory in the spring, consisting of a five-story brick building, 40 x 100 feet. This company has outgrown its present quarters and is compelled to build this addition to meet the growing demand for its goods. When the new building is completed the company will have a working floor space of nearly 50,000 square feet. Land on Wallace street for the necessary addition has already been purchased.

Red Jacket Mfg. Company, Davenport, Iowa, manufacturer of pumps, has been compelled to put on a night shift at its new plant in the west end of the city, and the company is now running 22½ hours a day in order to keep up with orders. The company has more than doubled its capacity within the past year.

The Peoria Posthole Auger Company, Peoria, Ill., has been incorporated with a capital stock of $15,000. G. C. Powell, Otto Gillig and Charles A. Welberg are interested.

The new factory of the Giant Grip Horse Shoe Company at Little Falls, Minn., will be put in operation September 1. The equipment for the plant, which will be driven by electric power, is now being installed. It is the hope of the company to make 15,000 calks per day.

Miscellaneous.

The Leicester Card Clothing Company, Leicester, Mass., has been organized to manufacture card clothing and will occupy the buildings known as the Central Factory. The officers are: President, Alonzo B. Davidson; vice-president, Arthur F. Estabrook; clerk, J. Sidney Whittemore; directors, the officers and Nathan C. Estes, all of Leicester.

The New World Smelting Company, Seattle, Wash., will close contract in the near future for a 400-ton smelter and hydro-electric plant at Cooke City, Mont.

The Empire Plow Company, Cleveland, Ohio, is building a new plant, consisting of three buildings, 28 x 80, 22 x 100 and 81 x 60 feet, respectively.

The Manufacturers' Light & Heat Company of Pittsburgh, suppliers of natural gas, is making extensive arrangements for the extension of its lines into Beaver County, Pa. A number of other smaller towns are to be supplied with natural gas, and the company will require upward of 40 miles of new pipe lines.

The Duplex Coil Company, Fond du Lac., Wis., organized last December to manufacture an electric spark coil for use on gasoline engines in automobiles and boats, is to move into a new factory building by September 1. The duplex coil is

a patented device, the inventor being Herman G. Mueller, one of the members of the company. Because of the growth of its business and the demand for its goods more factory room is required. The officers of the company are as follows: President, W. O. Zehring, Dayton, Ohio; vice-president, G. M. Huber; secretary-treasurer, E. J. Huber; superintendent, H. C. Mueller, the three last named being residents of Fond du Lac, Wis.

Extensive additions to the Semet-Solvay coke plant of the Milwaukee Coke & Gas Company, Milwaukee, Wis., are now well under way and further additions are planned, to cost $13,000. With the completion of the new coke ovens, furnaces and incidental structures the capacity of the big plant will be practically doubled.

The Illinois Steel Company, Chicago, has bought for the Caspari Stone Company at Fairmount, Ill., 40 acres additional quarry land adjoining the present 80 acres owned by the steel company and operated by the stone company. This quarry furnishes the steel works with its necessary supply of calcite stone for blast furnace use.

The Elliott Car Works, at Gadsden, Ala., recently purchased by the Alabama Great Southern Railroad, is now being put in order. A large force is cleaning up the machinery and installing new machines. The plant will commence operations as quickly as possible.

Baker & Co., Incorporated, refiners and manufacturers of platinum, Newark, N. J., and New York, are making extensive additions to their Newark works. The rapidly increasing consumption of platinum in the industrial arts has made this extension necessary, especially in their refining department, which will be enlarged over 100 per cent. New and larger offices are also being erected and the entire plant equipped with the most modern appliances for the economical manufacture of their varied and high grade products.

The Kane-Champlin Company has been incorporated at Buffalo, N. Y., to manufacture and deal in automobiles, with a capital stock of $10,000. Directors: Oliver P. Champlin, Charles B. Kane, G. H. Kane and G. M. Champlin.

The Rare Metals Reduction Company has been incorporated at Buffalo, N. Y., with a capital stock of $4600. The directors are Stephen T. Lockwood, Merton S. Gibbs and Stephen Lockwood of Buffalo, and Theodore S. Todd of New York.

The foundations are being laid for the new boiler shops of the Great Lakes Engineering Works, Detroit, Mich., which are to be placed on the river front on the south side of the company's property. The new building, which will be of steel construction, 135 x 210 feet, will be divided into three bays. The machinery will be operated by electricity, compressed air or hydraulic power. It is expected that the building will be ready for operation early next spring and its completion will place the company in a better position to build vessels, as delays in receiving boilers for the new boats will be avoided. The shipbuilding plant of the Columbia Iron Works at St. Claire, Mich., which has been operated under lease for some time by the Great Lakes Engineering Works, has been purchased outright by the latter company and will be largely improved by the installation of new machinery.

The Impervious Product Company, Baltimore, Md., has awarded the contract for rebuilding its plant at Fairfield. The buildings are to be 150 x 250 feet and will be completed in about five weeks. The plant, which is located at the Patapsco River with deep water docking facilities and connections with the Baltimore & Ohio and Pennsylvania railroads, will be equipped with up to date machinery and will be one of the largest and best asphalt refining plants in this country.

The Broadway Mfg. Company, manufacturer of sash, doors, blinds, moldings and interior finish, Leavenworth, Kan., will establish a wood working plant at Memphis, Tenn. A power plant of 500 horse-power capacity will be installed.

Trade Publications.

Roller Bearings.—Anti-Friction Journal Box Company, 718 East First street, Los Angeles, Cal. Circular. Describes the Allen patent anti-friction double action roller bearings, which are adjustable to any axle or wheel and require no lubricant. It is claimed that the speed of automobiles may be increased from 5 to 10 miles an hour by the use of these bearings. The equipping of 50 per cent. of the shafting in the company's shop is stated to have reduced the power consumed 60 per cent. A vehicle wheel provided with the bearings spun by hand continued to revolve for 17 minutes.

Drawing Tables.—Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass. Catalogue D. Illustrates a number of adjustable drawing stands for schools, drawing classes, artists, architects, draftsmen, engineers, &c.

Revolution Counters.—Standard Gauge Mfg. Company, Syracuse, N. Y. Circular. Gives price-list of counters made with either round or square cases for either right or left hand rotary and reciprocating machines.

Oil Engines.—Marine Engine & Machine Company, Harrison, N. J. Bulletin No. 23. Contains a description of the Secor oil engine adapted for the direct driving of electric generators, pumps, &c., and for general power. An inclosed blue print shows a typical card taken from a 20 horse-power engine, and an indorsement by an electrical engineer, who declares this to be the best engine of the kind he has ever installed.

Thread Milling Machines.—Pratt & Whitney Company, Hartford, Conn. Souvenir mailing card. Has a hinged cover bearing an illustration of a 12 x 48 thread milling machine, which when opened exposes a recess containing a folded strip with illustrations of the 6 x 80 machine and a number of samples of work possible on the thread milling machine.

Machine Tools.—Marshall & Huschart Machinery Company, 62 South Canal street, Chicago, Ill. Loose leaf catalogue inserts. Pages 87, 88, 89 and 90 give illustrations and specifications of 14, 16, 20 and 24 and 34-inch high duty crank shapers as made by Gould & Eberhardt, and supersede pages of the same numbers previously issued. Page 58A shows a horizontal boring machine of Binsse make. Pages 59A to 59M show machines made by the Beaman & Smith Company, including Nos. 1 and 2 combined vertical and horizontal spindle milling machines; No. 4 vertical two-spindle milling machine; No. 1 horizontal spindle milling machine; Nos. 2, 3 and 4 duplex milling machines; No. 3 four-spindle milling machine; Nos. 1, 2 and 4 horizontal spindle drilling, boring, tapping and milling machine; Nos. 1 and 2 cylinder boring and facing machines. Pages 121A to 121C show Stoever pipe machines, including the 4-inch standard pipe machine, 4-inch automatic and 8 and 12 inch pipe machines.

Wattmeters.—Stanley Instrument Company, Great Barrington, Mass. Bulletin 90,531 and large blotter. Both pertain to rotated jewel bearing wattmeters for alternating current circuits. Bulletin gives instructions for installing, assembling, &c., and the blotter shows a view of the meter with general description.

Electrical and Steam Machinery.—Rossiter, MacGovern & Co., Incorporated, 17 Battery place, New York. Catalogue. Size, 3½ x 8 inches; pages, 78. Lists new and second-hand machinery which this company now has in stock.

Ore and Coal Handling Machinery.—Wellman-Seaver-Morgan Company, Cleveland, Ohio. Catalogue, 9 x 12 inches; 103 pages. The book is principally composed of large half-tones. The first few show exterior and interior views of the main plants at Cleveland and Akron, Ohio, in connection with which is given a short account of the company's facilities. The next division deals with the Hulett automatic ore unloaders, showing a number of installations. Among them are those at Conneaut, Ohio; the Lackawanna Steel Company, Buffalo, N. Y., and the National Tube Company's works at Lorain, Ohio, concerning which separate articles have appeared in past issues of *The Iron Age*. The next division pertains to unloading and reloading bridges, cranes, &c., and in this case, as before, a number of typical installations are shown. Just enough text is given with the engravings to hold the reader's interest. A general description covering the main points accompanies the engravings. The succeeding divisions of the book take up car dumping machines, locomotive cranes and revolving derricks, excavating buckets, &c., and other lines of work.

Hydrating Machinery.—Clyde Iron Works, Duluth, Minn. Pamphlet. Describes a line of machinery for hydrating lime by which the entire process is carried through in 20 minutes. The advantages of hydrated lime over the lump form are explained. The first stage is the crushing, for which a rotary fine crusher is used. The second stage involves the use of a hydrating machine, illustrations and table of dimensions of which are given. In connection with this are shown in detail an automatic sprayer and a three-way valve, and another view of the hydrating machine, showing it in position for discharging. The third stage requires a screening device, which is also shown. Further illustrations show an air separator and section of a typical plant, and finally the details of construction are discussed.

Steam Indicators.—Ashcroft Mfg. Company, 85 Liberty street, New York. Pamphlet. Describes the latest type of Tabor indicator. The indicator is made in forms adapted to use on all kinds of steam and gas engines. Special points of the indicator are covered in the pamphlet, including the parallel movement and the duplex springs. The latter are made for two radically different types of indicator, on one of which the spring is inside and on the other outside. Describes and illustrates the Houghtaling reducing motion, the Ashcroft reducing wheel, pantograph, indicators with electrical attachments for taking the cards, Coffin averaging planimeter, and indicator parts and supplies.

Roller Bearings.—Hyatt Roller Bearing Company, Harrison, N. J. Bulletins 123 and 126. The first is a collection of testimonials of Hyatt roller bearings. The second contains a description of a rolling road installed on a steep hill at Cleveland, Ohio. Teams are carried up this incline very quickly where before it was necessary for them to take a round about course in order to reach the top of the elevation. It was originally thought that it would require 400 horse-power to operate the road, but by the use of Hyatt bearings 120 horse-power was found sufficient.

Concrete Mixers.—Goold, Shapley & Muir Company, Limited, Brantford, Canada. Leaflet. Contains a reprint from a newspaper describing the use of a cement-concrete mixer in connection with the erection of a new dam, by means of which the work was accomplished with remarkable rapidity.

The Iron and Metal Trades

Apparently the United States Steel Corporation will pursue a cautious policy in its purchases of Pig Iron. The company has just bought 25,000 tons of Bessemer Pig, for delivery during the first half of September, paying for some of the Iron on the basis of $14.50 per ton and for some of it up to $15 per ton. It is understood that the corporation has now in blast 92½ per cent. of its total furnace capacity.

Some Basic Pig purchases have been made in the Eastern territory, sales aggregating about 10,000 tons have been effected in the Cleveland district and some buying has taken place in the Pittsburgh district. So far as known the 10,000-ton lot of Bessemer Pig for a plant in the Philadelphia district has not been placed. There have been further sales of low phosphorus Iron.

There has been a fair run of orders for Foundry Iron, and the first indications of some interest on the part of buyers for the first quarter of 1906 are appearing.

The scarcity of Steel is becoming more acute, particularly in the Chicago district. The announcement that the Steel Corporation will build seven additional 50-ton open hearth furnaces and an additional blast furnace at South Chicago is interesting in this connection.

Further heavy sales of Steel Rails have been effected, the aggregate being about 200,000 tons. Among them are one lot of 50,000 tons for the Santa Fé, and 25,000 tons for the Missouri Pacific, for 1906 delivery, and 10,000 tons additional for the St. Paul, for delivery this year. Orders for 200,000 tons more are pending.

An interesting transaction is the sale of 10,000 tons to the Grand Trunk road made by an American mill for delivery this year, the Canadian mill which had the order not being able to live up to its deliveries.

The increasing frequency with which premiums on Structural Material have been paid will in all probability lead the makers of Beams and Angles to advance their price in the near future. If this should be done it will be the first advance which has been made for some time.

Good reports continue to come from the Wire trade as to the tonnage being placed. The leading interest has booked about 140,000 tons thus far this month.

There is a fair buying movement in Sheets and in Tubes, but Tin Plate is still lagging.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug.30, 1905.	Aug.23, 1905.	July26, 1905.	Aug.31, 1904.
PIG IRON:				
Foundry Pig No. 2. Standard, Philadelphia	$16.25	$16.25	$16.25	$14.25
Foundry Pig No. 2, Southern, Cincinnati	14.50	14.50	14.50	12.00
Foundry Pig No. 2, Local, Chicago	16.25	16.25	16.25	13.50
Bessemer Pig, Pittsburgh	**15.35**	15.35	14.85	12.50
Gray Forge, Pittsburgh	*14.35*	14.00	14.50	11.75
Lake Superior Charcoal, Chicago	16.50	16.50	16.50	14.75
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	**24.00**	24.00	23.00	21.00
Steel Forging Billets, Pittsburgh	**27.00**	26.00	25.00	....
Steel Billets, Philadelphia	**27.00**	27.00	26.50	24.00
Steel Billets, Chicago	**29.00**	29.00	28.00	22.00
Wire Rods, Pittsburgh	*31.00*	32.00	32.00	28.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	**14.50**	14.50	14.00	10.50
O. Steel Rails, Philadelphia	16.00	16.00	16.00	11.75
O. Iron Rails, Chicago	**20.00**	20.00	18.75	15.75
O. Iron Rails, Philadelphia	**20.50**	20.50	18.50	15.50
O. Car Wheels, Chicago	**15.50**	15.00	14.75	11.00
O. Car Wheels, Philadelphia	**15.50**	15.50	14.50	12.00
Heavy Steel Scrap, Pittsburgh	**15.00**	15.00	14.25	11.50
Heavy Steel Scrap, Chicago	**13.75**	13.00	13.50	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago	**1.60**	1.60	1.55	1.35
Common Iron Bars, Pittsburgh	**1.60**	1.60	1.55	1.30
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.73½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	**1.89½**	1.74½	1.74½	1.74½
Beams, Pittsburgh	**1.75**	1.60	1.60	1.60
Angles, Tidewater	**1.89½**	1.74½	1.74½	1.74½
Angles, Pittsburgh	**1.75**	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, Sheared Iron, Pittsburgh	1.55	1.55	1.55	1.32½
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.00
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.05
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.60
Cut Nails, Mill	*1.60*	1.60	1.80	1.60
METALS:				
Copper, New York	**17.00**	16.00	15.12½	12.62½
Spelter, St. Louis	**5.55**	5.65	5.40	5.00
Lead, New York	**4.80**	4.60	4.60	4.20
Lead, St. Louis	**4.77½**	4.50	4.50	4.12½
Tin, New York	**33.00**	33.15	32.90	27.07½
Antimony, Hallett, New York	**14.50**	15.00	13.50	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.49

Chicago.

FISHER BUILDING, August 30, 1905.—(*By Telegraph.*)

The Rail mills embraced in what was formerly known as the Rail pool have at last opened their books for 1906 business and a large volume is being entered on the part of Western railroads, including one lot of 52,000 tons from a single buyer. Some time ago was recorded the statement of a leading official to the effect that 300,000 tons of Rails could be booked for 1906 in less than a week after books were opened, and the actual market conditions, now that the books are opened, seem to warrant such a statement. The Pig Iron market is without noteworthy event, but the tone is strong in the Chicago market in spite of bearish reports from Cincinnati published a week ago. Most of the producers have as yet declined to take business for 1906 delivery, while some of the Southern makers are asking $12.50 basis, Birmingham, for the first half of next year. Local furnaces have little difficulty in securing $16.50 at the furnace, or from $16.75 to $17, delivered in Chicago, for the fourth quarter of this year, while they are still selling on the basis of $16 at the furnace for limited quantities of spot Iron. Consumption of Structural Material is far in excess of production, and premiums for prompt delivery are paid willingly by consumers. Plate prices are held quite firmly despite rumors of shading amounting to 50c. to $1 a ton by independent mills on such sizes as they can roll. The Sheet market is demoralized, with no immediate relief in sight. The same is true of Wrought Steel Pipe, both Black and Galvanized. Boiler Tubes are firm. Cast Iron Pipe has been advanced 50c. a ton by the leading producers. Scrap is still on the upward grade, with advances all the way from 25c. to 75c. a ton since last report. Coke is firm on the basis of $2.50, Connellsville, for Foundry, and about $2 at the ovens for Furnace. Copper is up ¾c.; Spelter,

¼c.; Lead, ¼c., and there seems to be a good demand for these metals, particularly for prompt shipment.

Pig Iron.—No sales of any consequence have been closed during the past week and we are just entering the period when the usual differences of opinion exist as to quotations for the opening quarter of the coming year. While it is true that a round tonnage was placed a week ago for first quarter shipment on the basis of $12, Birmingham, that figure must not be taken as the ruling market price for first quarter Iron, as current quotations are now based on $12.50, Birmingham, for delivery beyond January 1. Northern furnaces are sold up and are out of the market for large tonnages, though they are still taking care of the current requirements of their own customers on the basis of $16 at the furnace for spot shipment and $16.50 for fourth quarter. The tone of the market is strong and an advance in Southern Iron is not unlooked for. Prices, Chicago delivery, are as follows:

Lake Superior Charcoal	$16.50 to $17.00
Northern Coke Foundry, No. 1	16.75 to 17.00
Northern Coke Foundry, No. 2	16.25 to 16.50
Northern Coke Foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.25 to 17.50
Ohio Strong Softeners, No. 1	17.05 to 17.30
Ohio Strong Softeners, No. 2	16.55 to 16.80
Southern Silvery, 4 to 6 per cent. Silicon	16.65 to 17.65
Southern Coke, No. 1	15.90 to 16.15
Southern Coke, No. 2	15.40 to 15.65
Southern Coke, No. 3	14.65 to 15.15
Southern Coke, No. 4	14.40 to 14.90
Southern Coke, No. 1 Soft	15.90 to 16.15
Southern Coke, No. 2 Soft	15.40 to 15.65
Southern Gray Forge	14.15 to 14.65
Southern Mottled and White	13.90 to 14.40
Malleable Bessemer	16.50 to 16.75
Standard Bessemer	16.80 to 17.30
Jackson Co. and Ky. Silvery, 6 % Silicon	18.30
Jackson Co. and Ky. Silvery, 8 % Silicon	19.30
Jackson Co. and Ky. Silvery, 10 % Silicon	20.30
Alabama Basic	13.65

Sheets.—The market is very much unsettled, because in the presence of conditions that seem almost to compel higher prices one hears of lower and lower prices made not only by independents but by the leading producer. On fancy grade Sheets, spinning, stamping, electrical, &c., the liberal premiums above ordinary Sheets once obtained are gradually disappearing. Galvanized Sheets are weak also in the face of high prices of Sheet Bars and Spelter. It is the general feeling that much higher prices than prevail could easily be maintained if the warring interests should succeed in patching up some sort of a truce. We quote: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05c. to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.40c. to 2.50c. for Nos. 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at $1 a ton less: No. 10, 2.41½c. to 2.46½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.26½½c. to 3.31½c.; No. 28, 3.46½c. to 3.56½c. Store prices on Galvanized Sheets are irregular, depending upon competition, high prices being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3.05c. to 3.15c.; No. 26, 3.25c. to 3.35c.; No. 27, 3.45c. to 3.55c.; No. 28, 3.65c. to 3.75c.; No. 30, 4.85c. to 4.95c.

Coke.—Prices are firm on the basis of $2.50, Connellsville, or $5.15, Chicago, for Foundry Coke and $1.90 to $2 at the ovens, or $4.55 to $4.65 to users of Furnace Coke outside of blast furnaces who pay the regular $2.65 freight rate, while blast furnaces have a rate of $2.35. The Milwaukee Solvay operations are out of the market for the balance of this year for shipment of Foundry Coke.

(By Mail.)

Structural Material.—Outside of inquiries for large tonnages from Western car builders there is not much doing in the Structural Steel market, because most of the consumers of this material have now recognized the fact that they cannot get shipments in time for the construction of buildings this fall and are therefore postponing building operations until the spring. The demand for smaller lots from store is very heavy and premiums are being paid above the 2c. minimum on a large number of sections, the stocks of which have been exhausted in the hands of the local producer. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2c. to 3c., according to quantity on hand in store or obtainable from mill.

Rails and Track Supplies.—The producers of Rails have at last opened their books for the receipt of 1906 orders and business is coming in in large volume. The Illinois Steel Company booked a large tonnage, including one order from a Southwestern road for 52,000 tons for 1906 delivery. At the present rate of entering orders it will require only a few weeks for all the American Rail mills to book a sufficient tonnage to keep their plants running full during the first half of 1906. The price for 1906 is the same as it has been during the current year, $28 a gross ton in 500-ton lots and greater, f.o.b. mill, with full freight to destination; $30 a ton for less than 500 tons down to car lots, and $32 a ton in less than car lots. Light Section Rails are firmer in price, the weights down to and including 12 lbs. ranging from $26 to $29; 10-lb., $32; 8-lb., $35, f.o.b. mill. Angle Bars are unchanged at 1.40c. to 1.50c. Spikes are stronger at 1.75c. to 1.80c. Track Bolts are quoted at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Billets.—Forging Billets are quoted regularly at from $30 to $32 in car lots of base sizes, with the usual extras, and as high as $35 is paid for prompt shipment.

Plates.—Business is in a most satisfactory condition, with all mills fully occupied, some of them being three to four months behind their orders. From the standpoint of the consumer, however, there is no difficulty in securing Plates for prompt shipment, as several of the mills outside of the Pittsburgh territory are making deliveries in from two to three weeks from receipt of order. We quote: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices: Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Bars.—The minimum price for Bar Iron to-day is 1.60c., and mills are only quoting that price on exceptionally desirable business, while there is a good deal of tonnage being placed at 1.62½c. and 1.65c., base, half extras, from mill, in car lots. Steel Bars are firm and a heavy volume of business is already entered on the rolling books of both the leading producer and independent mills. We quote: Iron Bars, 1.60c. to 1.65c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.10c. to 2.20c. rates, full extras; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Conditions are unchanged and are highly satisfactory to the producers of special grades of Steel of every class, as their books are full of business taken at a comfortable profit. Current prices for delivery of straight lots not covered by contract are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—The Pipe market has been growing worse rather than better right along, and the point must soon be reached when a turn for the better will be recorded, as it is impossible for Pipe manufacturers to pay present prices for raw materials and labor and sell Pipe at the current figures without suffering severe losses. Current discounts to consumers from mill on Black Steel Pipe are 77.35 to 77.85 per cent. discount on base sizes, ¾ to 6 inches, with Galvanized Steel quoted at 10 points less discount. Iron has not gone as low in proportion to Steel, however, and most producers are asking more than the 1½ points differential that was in vogue before the war in Steel Pipe prices opened. Jobbers are buying Steel Pipe at 81 per cent. discount, f.o.b. Pittsburgh, and better. Chicago jobbers are charging 76 to 77 per cent. discount from store in small lots.

Boiler Tubes.—The market is strong and prices are well maintained The following are official discounts, f.o.b. Chicago, in car lots: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.85. Store prices are nominally unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1⅛ inches	40	35	42½
1¼ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—An advance of 50c. a ton has been put into effect by the leading producer, making the present figures on small lots as follows: Water Pipe, 4-inch, $29.50; 6, 8 and 10 inch, $28.50; 12-inch and larger, $27.50, per net ton, f.o.b. Chicago, with $1 extra for Gas Pipe. Large municipal contracts are of course placed at lower basis than this. The city of Chicago last week closed an order for 2300 tons of 4-inch Pipe with the leading producer.

Old Material.—The Chicago, Burlington & Quincy road disposed of over 3500 tons of Material late last week, receiving higher prices thus far than secured by any railroad for nearly a year. Dealers continue to be the heaviest buyers and there is every evidence that large tonnages are being piled up by dealers who believe that there will be a comfortable profit in carrying these Materials into the winter. The following quotations represent the range of prices paid by large consumers from producers and dealers in car lots and greater, f.o.b. Chicago:

Old Iron Rails	$20.00 to $20.50
Old Steel Rails, 4 feet and over	14.75 to 15.25
Old Steel Rails, less than 4 feet	14.50 to 15.00
Heavy Relaying Rails, subject to inspection	23.50 to 24.00
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	15.50 to 16.00
Heavy Melting Steel Scrap	13.75 to 14.25
Frogs, Switches and Guards	13.75 to 14.25
Mixed Steel	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates	$17.50 to $18.00
Iron Car Axles	22.50 to 23.00
Steel Car Axles	17.50 to 18.00
No. 1 Railroad Wrought	15.75 to 16.00
No. 2 Railroad Wrought	14.75 to 15.00
Locomotive Tires, smooth	14.25 to 14.50
Railway Springs	13.00 to 13.50
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	12.00 to 12.50
Wrought Pipes and Flues	11.50 to 12.00
No. 1 Cut Busheling	11.25 to 11.50
Iron Axle Turnings	11.00 to 11.25
Soft Steel Axle Turnings	10.75 to 11.25
Machine Shop Turnings	10.75 to 11.00
Cast Borings	8.75 to 9.00
Mixed Borings, &c.	8.75 to 9.00
No. 1 Mill	9.25 to 9.50
Country Sheet	8.25 to 8.50
No. 1 Boilers, cut to Sheets and Rings	10.25 to 11.00
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.75 to 12.00
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.55 to 13.00

Metals.—Notwithstanding the sensational prediction to the contrary Copper has advanced ¾c. We quote Casting Copper in car lots 16¾c. to 16⅞c.; Lake, 16⅞c. to 17c., less than car lots, ½c. to ¾c. higher; Pig Tin, car lots, 35c. to 35½c.; smaller lots, 36c. to 36¼c. Spelter is held at 6c. for car lots and 6½c. to 6¾c. for small lots. Lead is 4.90c. for 50-ton lots, 4.95c. for car lots, and 5¼c. to 5½c. for small lots. Sheet Zinc is unchanged at $7.50 list, f.o.b. Lasalle, in car lots of 600-lb. casks. In Old Metals Copper Wire has been advanced ¼c., Copper Bottoms ½c. and Red Brass ¾c. We quote: Copper Wire, 14¼c.; Heavy Copper, 13½c.; Copper Bottoms, 13c.; Copper Clips, 13½c.; Red Brass, 13¼c.; Red Brass Borings, 10¾c.; Yellow Brass, Heavy, 9¼c.; Yellow Brass Borings, 8c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 4c.; Zinc, 4¼c.; Pewter, No. 1, 21c.; Block Tin Pipe, 29c.

The Chapman Brothers Junk Company, Chicago, has incorporated to do a wholesale junk business at a location to be selected in the western portion of the city. The company is organized with a capital stock of $16,000, with the following incorporators: Henry M. Goldsmith, Emma Kruse and Benjamin R. Morris.

Cincinnati.

FIFTH AND MAIN STS., August 30, 1905.—(*By Telegraph.*)

Pig Iron.—The market possesses a good, strong undertone in spite of the fact that conditions are not what we would call active. Prices are being well maintained and it now looks as though higher figures would eventually prevail. There is much speculation indulged in as to what the United States Steel Corporation will do in regard to the purchase of a large tonnage for September delivery. It is understood that it has an option on 40,000 tons of Bessemer Pig Iron, which if actually taken would have a very beneficial effect on the market in general. Reports show quite a heavy tonnage of Bessemer, Malleable and Basic having been sold in contiguous territory, but with the exception of one or two sales they have been in 100 and 200 ton lots. There is, however, an improvement along the line of inquiry in Steel making Irons and also for the Foundry grades evident in this territory. A portion of this inquiry reaches into the first half of next year, but is slow of development, as the furnaces appear reluctant to name a price for so remote a period. The large Southern furnaces are apparently holding firm at the established schedule, yet we find some Iron being sold below this figure, probably the result of a differential in freight rates. One of the large Cast Iron Pipe interests is reported to have bought 1500 tons of Southern mixed grades at a concession in price. There is an inquiry from a central Ohio stove manufacturer for 1000 tons of Southern No. 2 Soft, delivery to be made during September. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$14.75 to $15.25
Southern Coke, No. 2	14.25 to 14.75
Southern Coke, No. 3	13.75 to 14.25
Southern Coke, No. 4	13.25 to 13.75
Southern Coke, No. 1 Soft	14.75 to 15.25
Southern Coke, No. 2 Soft	14.25 to 14.75
Southern Coke, Gray Forge	13.00 to 13.50
Southern Coke, Mottled	12.75 to 13.25
Ohio Silvery, No. 1	18.15 to 18.40
Lake Supeiror Coke, No. 1	15.65 to 15.90
Lake Superior Coke, No. 2	15.15 to 15.40
Lake Superior Coke, No. 3	14.65 to 14.90
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$17.75 to $18.25
Lake Superior Car Wheel and Malleable	17.75 to 18.00

Coke.—Trade is good and the market is strong. Contracts are being made for the next six months at the ruling quotations. As is usual at this time in the year there is more or less trouble in shipments coming forward owing to lack of transportation facilities. We quote the best grades of Connellsville Furnace Coke from $2 to $2.10, and the best grades of Foundry from $2.40 to $2.60, f.o.b. oven.

Finished Iron and Steel.—The demand continues active and the general tone of the market is one of unquestioned strength. Considerable new business is coming forward in the Structural line, making a heavy demand for Plates and Shapes. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The market for this class of Material is quiet, yet withal strong. Dealers expect a more active trade within the next week or two. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $14 to $15 per net ton; No. 1 Cast Scrap, $12 to $12.50 per net ton; Iron Rails, $18 to $19 per gross ton; Steel Rails, rolling mill lengths, $13 to $14 per gross ton; Relaying Rails, 56-lb. and upward, $22 to $23 per gross ton; Iron Axles, $19 to $20 per net ton; Car Wheels, $14 to $15 per gross ton; Heavy Melting Scrap, $12 to $12.50 per gross ton; Low Phosphorus Scrap, $14 to $14.50 per gross ton.

Cleveland.

CLEVELAND, OHIO, August 29, 1905.

Iron Ore.—The increasing demand for boats for the Coal trade on the lakes has a tendency to limit the supply of tonnage applicable to the Ore trade. But vessel capacity is so abundant that there is hardly any possibility of any such shortage as would hamper the movement down the lakes. The most serious obstacle which is presented at the present time is the growing scarcity of cars both for Coal and Ore. The docks are so seriously congested that any limiting of the car supply would immediately check the movement of Ore down the lakes. Vessel rates have not changed, holding at 75c. from the head of the lakes, 70c. from Marquette and 60c. from Escanaba. Some Ore buying is reported recently by furnaces rounding out their supply.

Pig Iron.—A meeting of the Bessemer Association was held in Cleveland on Saturday, at which time it is understood an inquiry for Iron from the United States Steel Corporation was considered. The market is very strong and sellers are bullish on the situation. The indications of a little uncertainty a week ago have disappeared, with prices firmer than they have been for several weeks. All of the furnaces are now quoting Bessemer at $14.50 at the furnace, which is the general price. Orders for small amounts have been placed at that figure. Contracts for Basic Iron closed in this territory during the past week have aggregated about 10,000 tons, with an inquiry which will add 5000 tons and several contracts pending which range from 1000 to 1500 tons. Recent contracting has been at $14.50 in the Valley. The Malleable Pig Iron market is strong on the same basis. It is evident that some of the Foundry Iron furnaces in the Valleys are not quite so well filled, some of them being willing to take low priced business. It is known that a good many contracts are still being taken at $14.25, at furnace, with indications that a good block of business might be closed on a lower basis. There are evidences that the Coke market is stronger, buyers showing a disposition to cover before prices advance. The market holds at $2.35 to $2.50 for the best grades of 72-hour Foundry Coke, while Furnace Coke is selling at $2 at the oven.

Finished Iron and Steel.—The practical opening of the books of the Steel mills for Rail business for 1906 on the

$28 basis has brought out a lively inquiry in this territory. Contracts here are usually limited to the smaller railroads and the tractions, but the indications are that they are going to need a considerable tonnage. The supply for immediate shipment is very short. It is known that one large consumer has offered within a week to take 10,000 tons for delivery beginning September 1 at a premium of $4 a ton over the association price. The larger mills refused the business. The smaller mills are getting $4 and $5 a ton premium. The larger Steel makers took contracts last week for Structural which will aggregate between 12,000 and 15,000 tons. While the mills are filled for this year, and while they are not willing to sell into next year, the above contracts are placed upon the condition that specifications shall be immediately forwarded, delivery to be made when convenient to the mill. Some of the mills are so loaded up that orders of this character will keep them busy through January and a good part of February, according to the outlook at the present time. The shipbuilders have not taken any more orders for boats, but it is understood that contracts for seven new vessels are pending and will be announced in a very short time. Reports are also that Plate mills are more crowded and that deliveries are getting slow. The demand has been springing up from all quarters here of late. This is probably due in part to the general understanding that an effort is being made to advance the price of all of the staples of Steel production, especially Plates and Shapes, with Steel Bars possibly included. The buying of Steel Bars has been especially heavy during the past few days, the indications being that all buyers are taking more on contract than they have ever taken before. Most of the mills are well sold up. The price still holds at 1.50c., Pittsburgh, for both Bessemer and Open Hearth. The Billet situation is especially strong, some of the larger mills being buyers in the open market, with the supply short. It is understood one inquiry for 50,000 tons has not yet been covered. The price holds very strong at between $26 and $27, Pittsburgh, for Bessemer 4 x 4 inch Billets, with the usual difference for Forging Billets. The Sheet market shows little change, the mills making concessions on quick shipment orders, but holding prices for advanced delivery. Sheets out of stock are firm at 2.15c. for No. 10 Blue Annealed, 2.65c. for No. 28 One Pass Cold Rolled and 3.65c. for No. 28 Galvanized.

Old Material.—Dealers are still buying rather heavily, but consumers have not added largely to their commitments. Prices hold about as they have been, the following representing asking prices of dealers, gross tons: Old Steel Rails, $15; Old Iron Rails, $20 to $21; Old Car Wheels, $15 to $15.50; Heavy Melting Steel, $15. Net tons: Cast Borings, $7.50 to $8; No. 1 Busheling, $13 to $13.50; No. 1 Railroad Wrought, $15.50 to $16; Iron Car Axles, $21 to $22; No. 1 Cast, $13 to $13.50; Stove Plate, $10; Iron and Steel Turnings and Drillings, $10 to $10.50.

Philadelphia.

REAL ESTATE TRUST CO. BUILDING, August 29, 1905.

The approaching close of the summer months has not developed any important change in the Iron and Steel trades. Conditions are of course highly prosperous and prospects are believed to indicate further improvement, but there is no "boom." There is a quiet confidence in the permanency of present conditions and no thought of any appreciable reaction for a long time to come seems to be entertained. It is expected, in fact, that 1906 will be a banner year, as by that time the country should have realized on the bounteous crops of this year, which will no doubt be of greater money value than any that has hitherto been raised. In addition to the general distribution of funds from this source the advantage to the transportation companies will be enormous, and these in their turn will probably consume more Iron and Steel than they have ever done in any previous year. The shipyards are also in splendid condition and have as much work in hand as they have ever had, if not more. The agricultural implement manufacturers are also sure to be large consumers, so that, without going outside of our own country, there is not much risk in figuring on the heaviest consumption of Iron and Steel on record. Reports from Europe begin to be more favorable, and, while no great increase in exports is probable, specialties such as Wire, Wire Nails and possibly both Wrought and Cast Iron Pipe may be taken in quantities sufficient to help those interests considerably. But present conditions are, as we said before, entirely favorable, although they are not "booming" by any means. Pig Iron is on the whole strong, with a demand fairly in proportion to the supply, but consumers can get all they want at quoted rates for 1905 deliveries. For the first quarter of 1906 sellers usually want a trifle more money, but it depends upon who wants it. If it is for some large concern which buys heavily for forward delivery they might get equal terms as for the last quarter, but it depends on circumstances, and as a rule it may be said that higher prices are quoted for 1906 than for any delivery during 1905. Except in Structural Material it cannot be said that there is any notably heavy demand for finished products. There is a fairly good demand for Plates and Bars, but there is no trouble in getting quick deliveries, neither is there any difficulty in regard to prices, which are absolutely steady and unchanged. A little more business than is now available would be promptly responded to by firmer prices, but at the moment the best that can be said is that there is a full average demand, that prices are steady and prospects for the near future are unusually satisfactory.

Pig Iron.—The uneven condition of the Pig Iron market continues, although on the whole the feeling is probably a little stronger. This refers more particularly to Foundry grades and to Iron for Steel making, Mill Irons being extremely dull and somewhat uncertain as to prices. Consumption is very large, however, and it is doubtful if the output more than keeps pace with it. This will ultimately decide the question of prices. If there is a full supply of Pig Iron prices are as high as they will go, but if there is even a very small shortage they are almost sure to work higher. From present indications there is not much probability of any appreciable disproportion between supply and demand, and until there is something of that kind quotations will not vary much from those now in force. It is clear that the business is in stronger hands than ever before; consequently prices will not be allowed to get very far from what are warranted by legitimate conditions. Indications of excessive supplies are met by an immediate curtailment of output, while an increasing demand is promptly met by the starting up of additional capacity. It may require an advance in prices to start up some of the idle capacity, but when there is satisfactory evidence that more Iron will be wanted immediate provision will be made for its production. This steadies the market and prevents such wide fluctuations as have occurred in former years. The present feeling is that very heavy buying will be done during the next 30 days and prices may be a shade higher. Quotations during the past few days have been at the outside figures, but most of the sales have been at inside or medium figures, although the market is perceptibly stronger on good qualities of all grades. Prices for Philadelphia and nearby deliveries are about as follows:

No. 1 X Foundry	$17.25 to $17.50
No. 2 X Foundry	16.25 to 16.50
No. 2 Plain	15.75 to 16.00
Standard Gray Forge	14.75 to 15.00
Basic	15.50 to 15.75
Low Phosphorus	20.50 to 21.00
Southern No. 2 X, rail	15.50 to 15.75
Southern No. 2 X, on dock	15.00 to 15.25
Southern Gray Forge	14.50 to 14.75

Ferromanganese.—The market is strong and easily $1 to $2 per ton higher. Prompt shipments are held at about $48, on dock, and it is doubtful if much less could be done even on large tonnages.

Ferrosilicon.—Scarce and held at $92.50 to $95 for immediate deliveries.

Steel.—The market is very strong and for shipments during September and October prices are firm at $27 to $27.50, delivered.

Muck Bars.—There is some prospect of business in this line, although in the meantime bids are at low figures, say, $26.50, while sellers ask about $1 more money, with a possibility of sales going through at about a medium figure.

Plates.—There is a considerable amount of business being entered, but for the moment specifications are rather slow, so that mills could handle more business if they had it in hand. Prospects are very good, however, and there are no complaints of the present inactivity, which is believed to be only temporary. Prices steady and unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100
3-16-inch thick	$0.10 pounds extra.
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—To say that the mills are overrun with business describes the situation very feebly. Official quotations are unchanged, but to those who can furnish deliveries inside of 60 to 90 days buyers are paying anywhere from $5 to $10 premium, and it matters little what the official quotations are. Prices are of no material consequence to many buyers; the difficulty is to get deliveries without having to wait until next year, as a great many will have to do, as everything that can be turned out this year is already under contract. Nominal quotations are as follows, actual prices three to four-tenths more money:

Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—Business is fairly active and there is an impression that it will be considerably more so during the coming month. Inquiries are more numerous, and specifications come in satisfactorily, so that mill owners feel quite encouraged and may advance prices at their next monthly meeting. A great many orders are being entered at full quoted rates, which probably signifies an early advance in prices, which for the present remain at 1.63½c. for Best Refined Iron. Steel Bars are strong and, while they are quoted at the same prices as Refined Iron, it is almost impossible to get satisfactory deliveries.

Sheets.—There is a better demand and mills are running quite full, but prices make no response and remain as last quoted—namely, 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—There is very little change to note in this department. Rolling Mill Scrap is in good demand at full prices, but Steel Scrap is rather sluggish. There is sharp contention in regard to prices, which consumers consider too high. It resolves into a question of whether sellers or consumers can hold out longest, and holders seem to think the result will be in their favor. Bids and offers are as follows for deliveries in buyers' yards:

Scrap Steel Rails	$16.00 to $16.25
No. 1 Steel Scrap	15.50 to 16.00
Old Steel Axles	21.00 to 21.50
Old Iron Axles	25.00 to 25.50
Old Iron Rails	20.50 to 21.00
Old Car Wheels	15.50 to 16.00
Choice Scrap, R. R. No. 1 Wrought	20.00 to 20.50
No. 1 Yard Scrap	18.00 to 18.50
Long and Short	17.00 to 17.50
Machinery Scrap	14.50 to 15.00
Wrought Iron Pipe	15.00 to 15.50
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	11.50 to 12.00
Wrought Turnings	13.50 to 14.00
Axle Turnings, Choice, Heavy	14.00 to 14.50
Cast Borings	9.75 to 10.00
Stove Plates	13.00 to 13.50

Pittsburgh.

PARK BUILDING, August 30, 1905.—(*By Telegraph.*)

Pig Iron.—Reports are that the United States Steel Corporation has bought a moderate tonnage of Bessemer Iron for September delivery. The exact tonnage or the price paid for the Iron has not been given out here, as all parties interested in the transaction refuse absolutely to discuss it. It is safe to say that the price was not under $14.50, Valley furnace, and it is possible $15 may have been paid for part of the Iron. The Bessemer Pig Iron market is very firm to-day on the basis of $14.50, Valley furnace, and some sellers quote $15 for September and October shipment. A local interest reports a sale of 2000 tons of Bessemer at $15, Valley furnace, for September and October shipment. The purchase made by the Steel Corporation will undoubtedly have the effect of strengthening the Bessemer Iron market, and it is probable that the price of Bessemer will be $15, at furnace, within a very short time. The demand has been very active for some time and it is believed that several of the other leading Steel companies will be purchasers of Iron before long. The Carnegie Steel Company has ordered in blast every stack it owns, with the exception of two or three isolated stacks, which may possibly not be operated again. Foundry Iron continues quiet and prices are only fairly strong. Northern brands are held at $14.25 to $14.50, at Valley furnace, but on good sized tonnage and for prompt delivery $14 could be done. Gray Forge Iron is very dull and we are not advised of any sales made in this market for some time. We quote Northern brands at $13.75, Valley furnace, or $14.60, Pittsburgh, but on a firm offer this price might be shaded from 15c. to 25c. a ton.

Steel.—There seems to be practically a famine in Open Hearth Billets, and sales of these have been made for prompt delivery as high as $26 to $27, maker's mill. We quote Bessemer Billets for prompt delivery at $24, and Open Hearth at $25 to $27, prices depending largely on the deliveries wanted by the customer. Sheet and Tin Bars are held at $25 to $26, maker's mill, but it is possible that for prompt delivery $27 would have to be paid. The whole Steel market is in an acute position, and it looks very much as though consumers who are not covered by contracts will soon have to pay fancy prices for their Steel. Forging Billets are held at $27 and upward, prices depending altogether on the carbons.

Steel Rails.—Up to this time the Rail mills have entered orders for over 2,000,000 tons of Rails for delivery this year, upward of 250,000 tons having been placed in the past week. The Pennsylvania Railroad Company is in need of more Rails, but the mills are so filled up on tonnage that it is doubtful if deliveries wanted even by that company can be made. The Steel Corporation has entered orders for considerably over 100,000 tons for next year's delivery.

(*By Mail.*)

We note quite an active inquiry for Bessemer Iron for shipment over the balance of this year. One leading Open Hearth Steel plant is in the market for 5000 tons for forward delivery, on which $14.75 to $15, Valley furnace, has been quoted, but the business has not yet been closed. All the activity in the Pig Iron trade seems to be centered on Bessemer, as there is not much doing in either Foundry or Gray Forge, and prices on both are rather weak, especially on Forge. For Northern brands of No. 2 Foundry Iron most sellers quote $14.25 to $14.50, at furnace, but on good tonnage a few furnaces would accept $14, at furnace. There is very little inquiry for Forge Iron, and Northern brands are held at $13.50, Valley furnace, or $14.35, Pittsburgh. The Steel market seems to be approaching a famine, and mills that are in position to make reasonably prompt shipments of Billets are asking fancy prices. Reports are that both Bessemer and Open Hearth Billets for prompt delivery have sold at $26 to $27, maker's mill. Sheet and Tin Bars are scarce for prompt delivery, but at the same time it must be noted that most Sheet and Tin Plate mills that buy their Bars in the open market are covered by special contracts for their full supply. In Finished Iron and Steel conditions show no material change. The demand for Structural Steel is not quite as active as it was, but the Structural shops are filled up for some months ahead, while the Structural mills are very much behind in deliveries. Heavy premiums have recently been paid for prompt shipments of Structural Shapes. Plates continue quite active, and the same is true of Rails, the mills being practically filled for the balance of this year. Leading mills rolling Steel Bars have taken some very heavy tonnage recently and are filled up for the next several months. Sheets and Tin Plate, which have been abnormally quiet for some time, are showing a slight betterment in demand, but there is still plenty of room for improvement. The Pipe trade is fairly active, but prices are low. There is a good deal of inquiry for Scrap, but only a limited tonnage is selling, as consumers decline to meet the ideas of sellers on prices.

Ferromanganese.—We note a sale of 50 tons of 80 per cent. foreign Ferro at $49.50, delivered, but note that most sellers now quote $50, delivered. The Ferro market is quite firm and inquiry is more active than for some time.

Rods.—One of the leading local mills is out of the market as a seller, using its entire output of Rods in the manufacture of Wire products. We quote Bessemer and Open Hearth Rods at $31 to $31.50 and Chain Rods $32.50 to $33, maker's mill.

Steel Rails.—Reports are that the Pennsylvania Railroad Company, which early in the year bought over 100,000 tons of Rails, will come in the market in a very short time for 25,000 tons more for delivery this year. Western roads have been active buyers of Rails recently, placing contracts for upward of 50,000 tons. It is said that the actual orders on the books and shipped out by the Rail mills this year already exceed 2,200,000 tons, and the total business for this year is expected to considerably exceed 2,500,000 tons. There is an active inquiry for Light Rails, which we quote at $23.50 to $27, maker's mill, depending on sections.

Skelp.—New business in Skelp is rather light, but the mills are pretty well filled up on contract. One of the local mills has recently taken a very large order for Skelp for export. Prices are firm and we quote: Bessemer Grooved Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, $1 advance; Grooved Iron Skelp, 1.60c.; Sheared, 1.67½c. to 1.70c., maker's mill.

Plates.—The demand for Plates continues very active and a good deal of business is in sight. Some of the leading railroads are figuring on the placing of large orders for cars, and if only a part of this business is given out it will mean a huge tonnage to the Plate mills. Several of the leading mills are practically sold up for balance of this year on certain sizes. Prices are firm and we quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—Indications are that the strike of the Structural Iron workers, which has affected operations of the American Bridge Company to some extent, will be settled within a short time. The Eastern Steel Company has about finished building its Structural mills at Pottsville, Pa., and is in the market as an active seller of Structural Shapes. No very large contracts have recently been given out in this district, but local shops are full of work and are handicapped severely in getting shipments from the mills, which are very much behind in delivery. As noted last week, heavy premiums are being paid for prompt shipments of Structural Steel. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—A good deal of large contracting for Sheets is being done in a quiet way, shipments on these contracts to be made when the buyers are ready to take in the material. Current business is also showing improvement, but there is not yet enough tonnage in Sheets to keep all the mills busy. Reports of an early advance in Black and Galvanized Sheets cannot be confirmed and are believed to be untrue. Some of the Sheet mills are still very short of orders, but claim they cannot meet some of the low prices being quoted and for this reason are not able to secure tonnage. Prices are fairly firm, but unchanged, and we quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. The lower prices quoted on Black Sheets represent minimum of the market and are obtainable only on large tonnage. Galvanized Sheets are quite firm and we quote: Nos. 22 and 24, 2.75c. to 2.80c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—A very heavy tonnage has been placed in Steel Bars and good orders are still coming in from implement and vehicle makers, so that the mills rolling Steel Bars are comfortably fixed with tonnage for the next two or three months and are considerably behind in deliveries. The car building concerns are placing good sized orders for Iron Bars, and the mills rolling these, notably the Republic Iron & Steel Company, are quite full of orders. Indications are that the Bar mills will have plenty of work during the winter months. We quote Steel Bars at $1.50, base, half extras, f.o.b. Pittsburgh, for carloads and larger lots. Iron Bars are quite firm and we quote these at 1.60c., Pittsburgh.

Hoops and Bands.—New tonnage in Hoops and Bands, with specifications on old contracts, keeps the mills well filled up. Prices on Bands are being firmly held and we quote these at 1.50c., extras as per Steel card, and Hoops at 1.65c., at mill.

Tin Plate.—While there is some improvement in the volume of new tonnage in Tin Plate, there is not sufficient business by any means to keep all the Tin Plate mills busy and some of them are doing very little. The American Sheet & Tin Plate Company has recently started its New Castle works at New Castle, Pa., containing 20 hot mills, and has also started 20 hot mills in its Shenango works at New Castle, and which contains 30 mills. It is said that the outlook for heavier tonnage in Tin Plate is fairly satisfactory, but it is not believed that the canning interests and meat packers will buy as heavily as last year, as some of them still have good sized stocks. We quote Tin Plate at $3.50 to $3.55, base, terms 30 days, less 2 per cent. off for cash in 10 days. These prices continue to be shaded 10c. to 15c. a box by some of the jobbers who are still carrying large stocks and also by some of the outside mills.

Merchant Steel.—Mills report very heavy contracts being placed, and leading makers, such as the Crucible Steel Company, Cambria Steel Company and others, have about all the business they can handle and are very firm in their ideas as to prices. The market is firm and we quote: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads. For delivery at certain competitive points these discounts are slightly shaded by one or two concerns.

Railroad Spikes.—The demand for Spikes is quite active, and the two local makers are well filled up with orders for the next several months. We quote Railroad Spikes at $1.65 to $1.70 per 100 lbs., maker's mill.

Spelter.—Conditions in the Spelter market seem to be somewhat mixed, reports from the West indicating lower prices, but at the same time predicting that Spelter will be higher than ever before long. To-day prime Western Spelter is held at about 5.55c., St. Louis, equal to 5.67½c., Pittsburgh.

Merchant Pipe.—Tonnage in Pipe this month has shown considerable improvement over last month, but prices continue very low and show no immediate signs of getting better. The Booth & Flinn Company of this city recently placed a contract for about 70 miles of 8 and 10 inch Line Pipe, on which relatively low prices were made. The old official discounts have not as yet been superseded by a new list, but actual discounts are about 5 points lower, or on the basis of 80 per cent. off on Merchant sizes, this price being made to the larger trade only. These official discounts, which have not represented the actual market for some months, but which are 4 to 5 points lower, are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	69	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends, ⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ⅛ to 8 in.	56	45	54	43

Boiler Tubes.—We note a continued heavy demand for Boiler Tubes, the mills being four to six weeks behind in deliveries. Official prices are being firmly held, discounts to consumers being as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 3 inches	53	64
6 to 13 inches	41	56

Coke.—We note a fair amount of new business in both Furnace and Foundry Coke, and some inquiries are in the market for Furnace Coke for delivery next year. The Frick and Rainey interests started up some additional ovens last week and expect to fire some more this week. Car service in the region has been very good for a long time, the railroads furnishing promptly all the cars needed by operators to move their Coke. At present there are 30,231 ovens in the upper and lower Connellsville regions, of which 26,691 were active last week, output of both regions being about 337,000 tons. Strictly Connellsville Furnace Coke for prompt delivery is held at $1.80 to $1.85, while for the balance of the year delivery $2 to $2.10 is quoted. We are advised of a sale of 6000 tons of special high grade Furnace Coke at $2.25 a ton, at oven. This Coke was of special analysis, which accounts for the relatively high price. Connellsville 72-hour Foundry Coke is held at $2.35 to $2.50, at oven, for prompt delivery. Main line Furnace Coke is held at $1.60 to $1.75, and Foundry at $1.90 to $2.10, at oven.

Iron and Steel Scrap.—A waiting game is still going on between sellers and consumers of Scrap, and as a result very little tonnage is being sold. Dealers who have stocks of Scrap not only believe that present prices will hold, but think the market will go higher, and are inclined to hold their Scrap in preference to making concessions in prices. It is believed that stocks held by consumers are light and a general buying movement early in September is anticipated. We quote: Heavy Melting Scrap, $15 to $15.50; No. 1 Wrought Scrap, $15.50 to $16; Cast Iron Borings, $8.25 to $8.50; Bundled Sheet Scrap, $13 to $13.25; Cast Steel Scrap, $14.50; Machinery Cast Scrap, $14.50; Old Steel Rails, short pieces, $15 to $15.50; long pieces, $15.50 to $16, all in gross tons, f.o.b. Pittsburgh.

In connection with a newspaper paragraph to the effect that the stockholders of the Bessemer Coal & Coke Company met in Pittsburgh last week and authorized the directors to negotiate the sale of the company's coal properties at any time it was stated that this was regarded as the first definite step toward a merger of coke properties in the Lower Connellsville region. The company named above is not to be confounded with the Bessemer Coke Company, which advises us that it is not considering the sale of its coke properties to any one. There is believed to be no foundation for the report of a combination of coke properties.

The Machinery Trade.

NEW YORK, August 30, 1905.

The machinery trade will welcome the announcement made on Tuesday that the Japanese and Russian peace envoys have arrived at complete accord on all questions at issue and that it has been decided to proceed to the elaboration of a treaty of peace. For some time past many of the large machine tool manufactuers have been making connections with Japanese houses with the view of capturing a share of the business which is sure to develop on a very large scale as soon as the people shall have returned to peaceful pursuits. The natural consequence of the war will be the greater development of the country, and there is but little doubt that Japan, which has progressed so fast within the past few years, will make still greater strides in the near future. The machinery trade in this country has been patronized very liberally by the Japanese Government within the past two years. With their products already introduced, merchants have a hold on the trade which with the proper connections ought to result in the building up and maintenance of a large business with that country, particularly in the finer classes of machinery. The Japanese can engage in the manufacture of simple machinery, but it will likely be some time before they can take up the better class. While a majority of merchants seeking foreign trade have devoted most of their attention to Japan, there are others who are quietly putting out lines for Russian business. With Russia the ending of the war will mean the development of her vast resources and she also will probably be a good customer for our machinery. It is intimated in certain circles that not only these two countries but other Powers equally important will take immediate steps to establish closer trade relations with this country.

The announcement made in our Cincinnati machinery market to the effect that negotiations are now pending looking toward the absorption of the John Bertram & Sons Company, Limited, of Dundas, Ont., by the Niles-Bement-Pond Company is of considerable importance to the machine tool trade of the whole world. It has been known in inner machine tool circles that the Niles-Bement-Pond interests have had some project of establishing works across the Canadian border under advisement for some time. In duplicating its line at a Canadian plant the company will not only place itself in a position to cope more successfully with the fast growing Canadian consumption of machine tools, but will be enabled to compete more successfully for the trade of such foreign countries as maintain discriminating duties against the products of the United States. In securing the Bertram plant the company will not only acquire a very large going concern, but will eliminate from the field a competitor of American machine tool builders who has been keenly felt in connection with several large recent transactions.

Machine Tool Lists.

The ensuing month should stir up activity in the Pennsylvania Railroad Company, whose inquiries among the tool and machinery trade have been exceedingly few during the last few weeks of summer holiday. The meeting of the Board of Directors next month may result in the authorization of projected improvements and may release some contemplated work which needs only executive authority to commence. A well defined rumor predicts the early construction of 5000 new freight cars, but it is believed that nothing in this direction can be done until after the meeting of the Board of Directors. The following list represents the only equipment for which the purchasing agent is making inquiries at this time: One 500-pound helve hammer, one bolt heading, upsetting and forging machine; one 5-ton electric traveling crane, span 46 feet 4 inches center to center of runway rails, with cage in middle; one 6000 pounds capacity electric traveling crane; one two-stage air compressor, with compound steam cylinders; one 18-inch by 6-foot turret lathe, with the necessary hobs, leaders and followers.

It is expected that the machinery houses in the New York district will get a slice of the orders for machinery which will soon be placed by the United State Blowpipe & Hydraulic Works, Seattle, Wash., which is arranging to erect immediately a new main building, 60 x 160 feet, of modern type, in which will be installed a good sized amount of new machinery. The company is now in the market for one rotary splitting shear for elbow work ¼ inch and heavier; one squaring shear, 50 inches between housing, about ¼ inch capacity; one splitting shear to split sheets of any length and width, about ½ inch capacity; one set slip end rolls, 60 or 70 inches between housing; one set slip end rolls, 10 feet between housing; one drill press, 1¼-inch hole; one small band saw, about 36-inch wheel; one portable scale, about 2000 pounds capacity; one 8 horse-power upright tube or pipe boiler; one dipping tank, half round, about 4 feet wide, 4 feet deep and 30 feet long; one 30-inch sheet iron folder, capacity about 20 gauge; one turning machine, capacity about 16 gauge; one tinners' brake, capacity about 14 gauge, 10 feet long; one bending and crimping machine, capacity about 16 gauge.

The equipment of the new building will include four pairs 30-inch rolls, two pairs 36-inch rolls, two pairs 48-inch rolls, two pairs 62-inch rolls, one pair 76-inch rolls, one pair 122-inch rolls, one pair splitting shears, ¼ inch capacity; one pair splitting shears, ½ inch capacity; one pair splitting shears, ¾ inch capacity; one pair rotary shears, ½ or ⅜ inch capacity; one 36-inch squaring shears, ¼ inch capacity; 50-inch squaring shears, ¼ inch capacity; one bevel shears, ½ inch capacity, all of the Bertsch make; two No. 4 Long & Allstatter riveters; four punches, ¼ inch capacity; one punch, ¾ inch capacity, and one multiple punch to punch 70 holes ⅜ inch diameter in 3-16 inch plate, of the Geo. A. Ohl make; one post drill, one drill press, one radial drill and one lathe for making punches and dies. All of this machinery is to be belt driven. The motor equipment will include two 3 horse-power, three 5 horse-power, two 7½ horse-power and two 10 horse-power alternating current motors. There will also be installed a complete set of hand tools for light work.

J. G. Archer, who we understand is in charge of the equipment of the new buildings, is expected in this city about September 20, and it is thought that while he is here orders for part of the machinery will be placed.

The American Locomotive Company is now purchasing machinery for the automobile factory which is to be erected at Providence, R. I., for the manufacture of the Berleit automobiles, the rights to manufacture which the company secured several months ago. Albert T. Otto, who is located at the company's main offices at 111 Broadway, is making the purchases, and it is understood that $100,000 will be spent in equipping the plant. It is understood that no list has been sent out to the trade, but inquiries were made to various companies on machines and some orders have been placed. The majority of the orders remain unplaced as yet, however, as the work of selecting the machinery is no small task. While the large majority of the requirements are for machine tools, it is understood that the requirements include some heavy machinery and a considerable quantity of special machinery. The contract for the new plant has been let and the structure is well under way. The factory will be a fire proof structure 65 x 335 feet and three stories in hight. It is understood that the building will be used almost entirely as a machine shop. All the fine work in the manufacture of the automobile parts will be done in the plant, and it is understood that a number of some particularly accurate delicate machinery will be needed. The heavier work on the machines will be done at the locomotive plant at Providence. The first machines to be turned out at the new plant will be 25 and 40 horse-power, but later on it is expected that cars of the heaviest type will be built. As the buying for the plant is being done in New York, houses in this city are getting the main chance to bid on the machinery. It is understood that it has been planned to make the manufacture of automobiles an important part of the American Locomotive Company's business and later on, the trade predicts, there will be other plants and more machinery purchases. It is said that the company contemplates making later on cars to be used for passenger service in vicinities where there are no transit facilities. The Berleit car is equipped with a four-cylinder gasoline motor, the cylinders of which are cast in pairs without joints. The frame, shaft, axle, &c., are of nickel steel, which, it is claimed, gives a maximum strength with a minimum weight. The moving parts, contact pieces and the like are made of tempered steel. All the working parts are inclosed. The gear wheels operating the cam shafts, the water circulating pump, magnet and the governor are inclosed in a special oil tight case communicating with the crank case. The centrifugal pump is on the side of the crank case and the radiator and water tank are combined.

Machinery Requirements.

Extensive improvements are planned by the Ulster & Delaware Railroad Company at its yards at Oneonta, N. Y., the details of the plans for which have not yet been worked out. The plans contemplate the erection of a new roundhouse and the construction of a large coaling plant, besides other improvements which will likely call for the purchase of some new machinery.

Some new machinery will probably be required by the Lea-Degen Centrifugal Pump Company, a New Jersey corporation with an authorized capital of $700,000. The new company has acquired the patents lately granted to Julius Degen and E. S. Lea, consulting engineer, Trenton, N. J., on centrifugal pumps, and purposes to erect a shop in Trenton for the manufacture of these pumps on an extensive scale.

The firm of Bippus & Bryan, Wheeling, W. Va., is preparing to have erected a boiler plant, 40 x 100 feet. The firm will move some of its machinery from the Bellaire works formerly owned by Rosser & Castro, which was destroyed by fire about three years ago. The company expects to have the plant in operation the latter part of September. The company is in the market for a punch with 48-inch throat and a drill press on the line of a post drill to reach up to a 10-inch circle. The firm will also require a gas

engine of about 25 horse-power, besides a compressor and 2 3-16 inch shafting and boxing. The company will need other tools which have not been specified as yet. The firm is a new one and Howard A. Bippus, the senior member, is well known as a boiler maker and has been connected with the Bellaire steel plant, while John Bryan, the other member of the firm, was formerly general manager of the Bellaire Boiler Works. The company will manufacture boilers, stand pipe tanks, towers and sheet iron work.

Charles W. Mayer, Rochester, N. Y., manufacturer of punches, dies, special tools and machinery, is in the market for some good tools used in the manufacture of his line, also second-hand power press with 600-pound wheel and a surface grinder.

That portion of the plant of the William R. Trigg Shipbuilding Company, Richmond, Va., which has been conducted as a machine shop under lease for the past two years by C. B. Ford, and which was recently sold at auction, is to be operated by a new company, to be known as the C. B. Ford Company, which will have a paid-up capital of $100,000. It is understood that the new company is to make important improvements that will necessitate the purchase of considerable new machinery. The machine shop is 100 x 200 feet, and is equipped with a full line of modern machine tools, including a 25-ton crane which runs the entire length of the building. There are two warehouses on the property, one of which will probably be converted into a foundry, and the other into a boiler and blacksmith shop. The company will build and repair locomotives and will continue the manufacture of special machinery begun by Mr. Ford, including Magic molding machine for concrete building blocks, Nunnally quartering level, Jackson universal farm gate, Whitlock reciprocating sand pump, Turner mechanical trimmer for loading and trimming coal and other bulk carrying vessels, and the Little Wonder gasoline engine. At present the company has contracts on hand for steam shovels, digging machinery, &c., and the department for general machinery repairs is filled with work. Mr. Ford was formerly at the head of the engineering and mechanical department of the Trigg Company.

Charles E. Dustin Company, dealer in electrical and steam machinery, 11 Broadway, New York, with storehouses formerly located at Orangeburg, N. Y., has secured the large works formerly occupied by the Spiral Riveted Tube Company, Fiske and Mallory avenues, Jersey City, N. J., together with all the buildings, and has moved all its material from Orangeburg, the new works having been fully fitted for the purpose of handling and storing electric generators, steam engines, boilers and all forms of electrical and steam machines. There are four buildings and about 1½ acres of land, located on a side track of the Central Railroad of New Jersey.

Business Changes.

The National Twist Drill & Tool Company at its last annual meeting elected as a director J. O. Whitaker, president of the Whitaker Mfg. Company of Chicago. Mr. Whitaker has had wide experience in the manufacture and sale of twist drills, reamers and kindred lines, having had charge of the sales department of the Whitman & Barnes Mfg. Company for many years. Mr. Whitaker's company also acts as distributers or general sales agents, covering the entire West. The Whitaker Mfg. Company recently put in a large stock of twist drills, chucks, reamers, taps and a complete line of tools made by the National Twist Drill & Tool Company.

New England Machinery Market.

WORCESTER, MASS., August 29, 1905.

With the end of the summer months the promise of an exceptionally strong demand for machine tools and equipment of all sorts entering into metal working establishments seems to be reaching its fulfillment. The summer has been a remarkably good one. Its acceleration of business has been most marked. This is well evidenced by the books of one prominent machine tool company of medium size, which shows an increasing business with each succeeding month, beginning with November of last year, the increase being especially noticeable for July and August, which is a notable exception to the usual rule. General manufacturing shows an equally promising outlook, with a few exceptions, one such being the jewelry manufacturing business of Providence, R. I., and vicinity. But the staple products, as woolen and cotton goods, shoes and the vast variety of miscellaneous products of the New England mills and factories, are practically all in unusual demand. Every one is in good humor. Order books are in constant use instead of resting in comparative idleness on the shelves.

The question of delivery has become an important one. Those machine tool manufacturers who have stocked up during less prosperous times are now reaping a rich harvest, taking orders which would very likely go elsewhere. The inquiry is becoming frequent as to a company's ability to furnish machines for immediate shipment. Telegraphic orders which would have created almost a panic of joy not many months back no longer excite even surprise. For example, one of the great electric companies wired an entirely unexpected order to a New England manufacturer for eight turret lathes, amounting to nearly if not quite $12,000. The recent great Japanese order received by the Baldwin Locomotive Works, Philadelphia, resulted in the company buying every boring mill available, cleaning out entire stocks of the manufacturers, one New England company shipping five carloads in a day, all that were on hand, and the Baldwin Company is considered fortunate to have been able to get the machines they did, considering the present demand. Some companies have already reached the five months point in the matter of deliveries, and almost everywhere the general rule is six weeks and over. It is a pretty good time to buy tools if their need is expected within the next year, unless there is a certainty that there will be no haste when they are required.

The manufacturers are receiving more orders direct than formerly, eliminating the 10 per cent. commission to the dealers, for which they are proportionately thankful. Inquiries on large lots of tools are being received. One such is from the Philadelphia & Reading Railroad, which has a long list. There are more orders for lathes in medium lots, the single machines which have been the usual inquiry and order being replaced to an extent by lots numbering from three to six.

The manufacturers of machine tools have begun a discussion regarding an increase in prices. The demand has reached a point which warrants a consideration of this very important matter. The price of materials which go into the tools have advanced. For example, New England machine tool builders who have no foundries of their own have just been notified of an increase in prices for castings. This advance on machine tools would be on the base price under the general agreement now existing among the manufacturers and would be independent of the proposed readjustment of prices on geared heads and electrically driven tools, which has been under discussion for some time and to deal with which, so far as lathes are concerned, a committee of the National Machine Tool Builders' Association was appointed at the last annual meeting. This committee has rested during the summer, but it is expected that some definite agreement will be reached in the near future. In the meantime the demand for both these types of lathes has radically advanced as compared with the demand for the standard machine, and some of the dealers believe that the change will be a permanent one—that is, the geared head and electric drive will increase in popularity, especially where they are coupled in the same tool, which is a favorite combination at present. When the lathe manufacturers reach a base agreement on these types of machine it is probable that other branches of machine tool industry will soon follow the example.

J. H. Sessions & Son, Bristol, Conn., manufacturers of trunk hardware, are to erect a large plant on property recently acquired by them on Riverside avenue. There will be six buildings in the group. The largest will be 50 x 90 feet and four stories, and the others will be either one or four stories, their ground dimensions being 50 x 100 feet, 40 x 140 feet, 50 x 90 feet, 60 x 75 feet and 45 x 50 feet. Altogether, 50,000 square feet of floor space will be provided, which is almost double the capacity of the present buildings. The power house will be equipped for either steam or gas, and electric power will be installed for the operation of a part of the plant. Very little new machinery will be required. Shafting hangers will be needed. It is the company's intention to abandon its present factory, which will be for rent or for sale. The business was recently incorporated, the officers being: President and treasurer, A. L. Sessions; vice-president, M. F. Sessions, and secretary, L. B. Sessions.

The Standard Machinery Company, Mystic, Conn., manufacturer of bookbinders' machinery and printing presses, is to erect an addition to its shop, to be 75 x 100 feet.

The large plant which was built for the Van Choate Electric Company, Foxboro, Mass., and which has been idle for some time, has been purchased by Schaeffer & Budenburg, Brooklyn, N. Y., manufacturers of steam specialties. It is understood that the purchasers will remove their business to Foxboro, occupying a portion of the plant, and will in addition build a brass foundry. A portion of one of the buildings will be occupied by a new company, known as the Direct Cohair Company. The Van Choate factory is one of the best of its kind in New England, having been erected almost regardless of expense by a company that never actually began business.

D. B. McGregor, North Londonderry, N. H., has purchased the water privilege on the Contoocook River, Henneker, N. H., and will erect on the premises a leather board mill to cost $35,000. About 200 horse-power will be developed from the water privilege. Mr. McGregor will remove to Henneker his leather board business now conducted at Lee, N. H.

McCloud, Crane & Minter, Worcester, Mass., manufacturers of machine screws, have removed their factory from Union street to 326 Chandler street, that city.

Lynn, Mass., and New London, Conn., are about to erect manual training schools, which will require machine and other equipment.

The Whitcomb & Blaisdell Machine Tool Company, Worcester, Mass., has installed in its foundry the Cochrane system of making cast iron, the invention of Roderick Cochrane, Detroit, Mich. By the process a very tough but soft casting is procured, which may be punched and sheared without breaking. The general principle involved is the introduction of superheated steam under pressure into the stack.

Work is progressing rapidly on the additions to the plant of the Brown & Sharpe Mfg. Company, Providence, R. I., which have already been mentioned in *The Iron Age*. The new foundry will be practically doubled in size, a story is being added to one of the largest of the group of buildings and a building 50 x 60 feet and six stories will be erected. When the buildings are completed employment will be provided for several hundred additional men. The company now has about 3000 men upon its payroll.

Chicago Machinery Market.

CHICAGO, ILL., August 29, 1905.

The week has been one without any individual transactions of note, but still one in which the volume of business done was in excess of the average for the same period of past years. Machinery is being bought by such a wide diversification of interests in such a wide range of territory that the volume of business coming to both manufacturers and jobbers is sufficient to keep all hands busy. Locally, "machinery row" has been visited by a large number of buyers from all over the country and has been favored with liberal inquiries and mail orders from out of town. Demand for sceond-hand machines is showing a noticeable improvement. Agricultural implement works have been and still are liberal buyers of machine tools, the summer shutdown being followed by purchases of such equipment as is necessary to put shops in first-class condition for the coming winter's run. Manufacturers of boilers both for power and heating purposes are very busy and are adding liberally to their machinery equipments. There is a steady growth in demand for cement making machinery and tools, particularly cement block machines. Marine interests, stimulated by a large tonnage of vessels ordered or in process of construction, are also a noticeable factor in the purchase of labor saving machinery and tools. Builders of gas and gasoline engines and gas producers are busy to their ultimate capacity.

Announcement is made that the Chicago, Burlington & Quincy Railroad will close the deal for most of its $100,000 list this week, but no awards have been made up to the time of writing.

The new plant of the Morden Frog & Crossing Works at Chicago Heights, Ill., will practically duplicate the present plant at South Chicago, and as soon as the new plant is in operation the old plant will be removed to Chicago Heights, making ultimately a plant there that will double the size of the South Chicago plant. The plant at South Chicago, which we refer to as the old plant, is itself only two years old, and the equipment is such that it can be removed and installed in the second section of the new factory. A large equipment of engines, boilers, generators, motors, cranes, hoists and machine tools will be necessary to equip the first section of the Chicago Heights plant, and as far as can be learned little if any of this equipment has yet been purchased. The headquarters of the company is in the Rookery Building, Chicago.

Kearney & Trecker, builders of milling machines at West Allis, Milwaukee, have found the demand for their machines so greatly to exceed their ability to supply that they have begun the erection of a 50 x 100 foot addition to their plant. All the machinery necessary for this enlargement has been purchased.

The Sunset Mining Company, Rewey, Wis., has purchased air drills and an 85 horse-power boiler, which will be installed in its mine within the next ten days. A mill is to be erected within three months. O. Y. Rewey is secretary of the company.

The H. A. Stocker Machinery Company is moving into its new building at 20 and 22 South Clinton street from its temporary quarters on Canal street. The new building will be stocked throughout with new and second-hand machinery.

Joseph T. Ryerson & Son, Chicago, say that business has been exceptionally good; that inquiry is not only heavy, but that a very satisfactory proportion of inquiries develops into actual orders. Important sales have been made to Broderick & Quinlan, Muncie, Ind.; Penn Bridge Company, Beaver Falls, Pa.; Illinois Steel Company, Chicago; Rodgers & Burns, Muskegon, Mich., and F. S. Bowser, Fort Wayne, Ind., besides a good volume of individual orders and small tool equipments for customers all over the country.

Municipal and Power Work.

Apparently the Chicago city government is beginning to reach some semblance of order out of the chaos that has surrounded the municipal traction proposition, though opposition to this move is by no means silenced, and it will be a long time before iron and steel and machinery interests will be able to close any business with the city. About 275 miles of surface lines are contemplated, including the erection and equipment of power houses and the necessary cars and motors.

A St. Louis firm of architects and engineers was awarded the first prize for plans of the new county building, for which $5,000,000 in bonds had been authorized by a vote of the people. It will be some time, however, before bids can be asked for from machinery interests.

The Wisconsin State Board of Control has let contracts for electrical machinery for lighting plants at the State Hospital for the Insane at Madison and the State Prison at Waupun. The contract for the Waupun plant was let to the General Electric Company of Chicago for $5727, which includes a Corliss engine, generator and switchboard. The contract for the Madison plant was let to the Northern Electrical Mfg. Company, Madison, for $6135 and includes two Ball engines, two generators and a complete switchboard.

At a joint meeting of the Committees on Judiciary and Public Buildings of the city of Milwaukee, held Friday, August 25, it was decided to recommend for passage by the Common Council the proposed franchise of the Central Heating Company. The franchise has been under consideration ever since last May and has been amended in a number of particulars. One of the amendments provides that alleys instead of streets shall be used wherever practicable. Another provides that the city shall have the right to secure the property by arbitration or condemnation at the expiration of the franchise. The company proposes to erect a central heating plant and furnish steam heat for office buildings and residences.

The trustees of the various county institutions of Milwaukee County, Wisconsin, located at Wauwatosa, are considering the erection of a central heating plant and have called for necessary plans and estimates. It is said that the plant will cost about $200,000.

The Gainesville, Whitsboro & Sherman Railway Company will build a power house, car sheds, &c., at Gainesville, Texas, where the general offices of the company are located. Plans and specifications for the equipment of these buildings have been completed. Henry Bier, Gainesville, is interested in the road.

Contracts are to be let September 1 by the Fort Wayne & Wabash Valley Traction Company for a $1,000,000 power plant to be built in the northern part of Fort Wayne, Ind.

F. E. Pfannmueller & Co., Chicago, report a good volume of sales of second-hand engines and boilers during the last week, including a 200 horse-power Atlas engine for Owensboro, Ky.; complete stone crushing outfit for Oklahoma; complete boiler and power plant, except engine, for Joliet, Ill., and a long line of smaller installations.

Business Changes.

The Sterling Emery Wheel Mfg. Company, Tiffin, Ohio, has moved its store in Chicago, Ill., from 65 South Canal street to 30 and 32 South Canal street, the building at the former location having been badly damaged by fire in July. The company has at the new location a new and complete stock of abrasive wheels and grinding machinery. The managers at the Chicago store will be pleased to receive trade papers and catalogues of all kinds of machinery pertaining to its lines.

Philadelphia Machinery Market.

PHILADELPHIA, PA., August 29, 1905.

The gains made in the local machinery market have been maintained, and while a fair business has been transacted in nearly all branches of the trade there is still room for considerable improvement. It must, however, be remembered that the productive capacity of the greater majority of manufacturing plants has been largely increased and that it takes a very much larger volume of business than was necessary some time ago to keep everybody fully engaged. This is particularly noticeable at the time when the activity of the smaller and the larger tool manufacturing plants is compared, and more particularly those making a variety of smaller tools. The latter have in many instances been operating continuously throughout the summer at full capacity and frequently on double turn, while the former at times found it difficult to get enough business to keep them fully occupied.

Machinery dealers report a fair volume of new business, the demand being largely, however, for the smaller class of tools. Inquiries are better, but there is still some hesitancy on the part of buyers in closing up business promptly. There is a better demand for heavy engines, but the same lack of promptness in placing orders is complained of in this branch of the trade.

Second-hand machinery dealers have been a shade more active and the demand for small boilers, engines and electric motors has improved.

A few small lists from the various railroads are out, mostly for tools for replacement or minor extensions, the aggregate of which, however, is small. There is a noticeable absence at this time of any demand for extensive plant

equipment, new propositions in this territory requiring extensive equipments having either covered for their needs or are not yet in a position to fully estimate their probable wants.

The demand for castings continues unchanged. Competition for some classes of work is strong and some plants find it difficult to make deliveries as promptly as customers desire. Steel casting plants continue the most active, while gray iron jobbing foundries could handle larger tonnages without trouble.

There is but little change in the foreign demand; some lines are doing a fair business, while others are doing practically nothing. There is not much inquiry for the general line of tools, although special machinery has been inquired for to a small extent during the past week.

E. L. Fraser, representing the Hamilton Machine Tool Company and the Garvin Machine Company in this territory, has removed from 51-53 North Seventh street, and has opened a new wareroom and office at 622 Arch street in this city. A full line of tools manufactured by the above companies will be displayed on the floors of the new establishment.

Dienelt & Eisenhardt, Incorporated, are very busy in their machine department. Orders for a number of tube expanding machines are in hand, as are also orders for steam hammers and hydraulic jacks. The electrical department has received orders for a number of Monarch generators and motors, including a 50-kw. generator for local parties. The foundry is also fairly busy, but could handle a larger tonnage. Considerable good business is in prospect for the fall months and trade conditions are considered quite satisfactory.

H. B. Underwood & Co. note a heavy inquiry—particularly from the Eastern railroads—for their various railway shop repair tools. Portable boring bars have been in the best demand, and orders for a good number of these as well as for portable valve seat rotary planing machines and planer attachments have been booked. All departments of the plant keep continuously busy, and deliveries of various tools are being made to the Pennsylvania Railroad Company at Altoona and Pittsburgh, Pa., and other Eastern and Western railway shops. A 6-inch portable boring bar has also been delivered during the past few days for export shipment.

The Philadelphia & Reading Railway, which has under way a number of improvements and extensions at its new Reading shops, has let further contracts for the building of a large stack and for foundations and abutments for six additional boilers. These shops when completed will no doubt be among the most modern and best equipped railway repair plants in the East. A number of inquiries for tools for this plant are on the market and considerable machinery is yet to be bought.

The Eynon-Evans Mfg. Company is very busy in both its machine and foundry departments. This company has had a satisfactory number of orders for acid resisting bronze castings, particularly for use in connection with mining operations. There has also been a good demand for steam jet blowers, a number of which have been furnished various steel plants in different sections of the country. Inquiries have been numerous and a satisfactory business is anticipated during the balance of the year.

The Baldwin Locomotive Works will begin work on a new building at the corner of Seventeenth and Buttonwood streets early during the coming month. Property recently purchased at that location together with what the company previously had will enable it to erect a shop fronting 117 feet on Seventeenth street and 200 feet on Buttonwood street. The new building will be used principally for the making of electric trucks and it is also probable that the present brass shop will be moved to the new location. The Baldwin Works keep busy in all departments. Orders are being received in good number, one for 136 locomotives to be used on the Harriman lines, including the Union Pacific, Oregon Short Line, Southern Pacific and the Oregon Railway & Navigation Company, while orders for smaller quantities have been taken from various railroads and industrial concerns. Shipments of engines are being made by the Baldwin Works daily for many different roads, as well as for export to Japan and other foreign countries.

I. H. Johnson, Jr., & Co., Incorporated, is receiving a good number of orders for lathes, including several extremely large ones, with beds up to 50 feet in length. Inquiry keeps up well and considerable additional business is expected to be closed during the next few months. Deliveries of lathes recently have been heavy, including large tools to various nearby steel plants as well as to Western concerns.

A contract has been let by the United States Steel Corporation for a heavy blooming mill, which is to take the place of the mill at the Sharon works, which proved to be too light. The successful bidder was the Allis-Chalmers Company, Milwaukee.

Cincinnati Machinery Market.

CINCINNATI, OHIO, August 29, 1905.

The situation in machinery circles is about as it has been for several months past and shows a great amount of activity. August, which generally is conceded to be a very slow month, has exceeded expectations, and while there has been a slight decline in orders as compared with the preceding month business has been in every way satisfactory. The demand has been such that manufacturers have been unable to increase their stock to any extent, and in most cases have been running behind in daily orders. Foreign demand remains at the best, and instead of showing any signs of falling off is assuming vaster proportions, and bids fair to forge ahead of any previous record. It appears that Japan is still a heavy purchaser, and while perhaps in the market for a less number of tools than several months since, is sending in numberless small orders that in the aggregate are considerable. Reports indicate that the builder of heavier tools is having more difficulty in disposing of his output than is the case with the small tool builder. This it would appear also applies to engine builders, as a prominent builder along this line at Hamilton remarked that there were fewer calls for heavier type of engines than for the smaller. Considerable expansion is being planned among machinery builders at Hamilton and the city presents a very active appearance.

Niles-Bement-Pond Company to Get Canadian Plant.

A deal is now pending whereby the Niles-Bement-Pond Company expects to obtain control of the John Bertram & Sons Company, Limited, machine tool builders, located at Dundas, Ontario. This company has been a strong competitor of the Niles, who under this plan will be able to supply the Canadian demand through the plant located at Dundas. The present capital of the Bertram Company is $300,000, which will be purchased by the Niles-Bement-Pond Company. In addition to this the Bertram Company will increase its capitalization by $100,000 common stock and $200,000 6 per cent. preferred cumulative stock. The Niles Company will purchase the common stock and the preferred will be underwritten by it. The Niles Tool Works at Hamilton after many delays has succeeded in securing that portion of Second street immediately in the rear of its plant and plans are now being made for a large addition to the works. The company expects to erect a new foundry building, in which event the present foundry site will be utilized for building tools.

The Cincinnati, Dayton & Toledo Traction Company has secured the local line operating through the city and has purchased ground and will begin at once the erection of a large power plant for its entire line.

The Bentel & Margedant Company reports an excellent trade, most of which is domestic. It has recently added another building to its plant and installed new planers, drill presses, &c. The company has recently been making a specialty of railroad equipment and has secured some very large orders from this source. Twenty machines were shipped to Terrel, Texas, for the new shops of the Texas Midland Railroad; three large machines for the Wheeling & Lake Erie Railroad and two for the Vandalia Railroad shops at Indianapolis.

The Hamilton Machine Tool Company's new building is completed and tools are being installed. This building is a two-story brick structure and gives about 35,000 square feet additional room. Some months since mention was made in these columns that this concern had purchased the plant of the Belmer people located in Cincinnati. The Belmer plant is now closed and the tools are being forwarded to Hamilton, where they will form a portion of the equipment of the plant as expanded. The company is now in a position to manufacture a full line of standard tools. A 10-ton electric crane is now being placed in the foundry building. It has recently opened salesrooms and office at 622 Arch street, Philadelphia, with E. L. Frazer in charge. Mr. Frazer for the past ten years has been connected with the Garvin Machine Company, New York.

The Long & Allstatter Company reports that it has more than it can do, business coming mostly from the railroads and car shops, as well as all kinds of structural work, also some implement concerns and rolling mills. Foreign demand is fairly good and recent orders have come from Japan, Mexico, South America and Cuba. Prices are said to be holding firm, but are much too low when taken in consideration with the skilled labor employed.

The Hooven-Owens-Rentschler Company notes a falling off in the demand for heavy engines. It is busy, however, and a good general trade prevails. This is for the smaller sizes and is in keeping with the demand for a smaller line of machine tools than now obtains.

The Cincinnati Punch & Shear Company advises that it has a plan for reorganization on hand which if consummated will increase the working capital of the plant. R. J. Venner, a practical man from Cleveland, has been invited to inspect the business and is now on the ground with a view of entering the company. The present officers are: Presi-

dent, Dr. F. G. Cross; vice-president, Charles Weber; treasurer, H. M. Moore; secretary, S. M. Cross.

The D. T. Williams Valve Company, which recently purchased the patterns, good will and the exclusive right to manufacture the Cookson steam trap and Cookson separators for steam or oil service from the Cookson Steam Specialty Company of this city, is now looking around for more commodious quarters. A number of lathes, boring mills and drill presses have been recently added to the equipment and it is now in the market for three lathes from 16 to 18 inch to further increase its capacity. A large order was recently received from the Government, shipment to be made to Mare Island, Norfolk, Boston and League Island navy yards.

The Bickford Drill & Tool Company is very busy and report a large number of orders booked ahead. The railroads have become very heavy buyers and a large number of tools is constantly being ordered. Prices are said to be stable, but are deemed in most instances to be too low. A heavy trade for the remainder of the year is predicted.

Government Purchases.

WASHINGTON, D. C., August 29, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 12 for a quantity of supplies for the Portsmouth, Boston, Newport, New York, League Island, Washington and Norfolk navy yards, including electric drills, &c.

Manning, Maxwell & Moore, New York, has been awarded class 7, three Scotch marine boilers, at its bid, $2418, under opening of July 31, at the office of the Isthmian Canal Commission, serial No. 247.

Under bids opened June 27, for machine tools for the various navy yards, the Niles-Bement-Pond Company, New York, has been awarded class 92, one set of bending rolls, $1460.

The following bids were opened by the Isthmian Canal Commission August 22, under serial No. 256, for steam hammers, radial drills, grinding machines, &c.:

Bidder 1. Baird Machine Company, Pittsburgh, Pa.
2. Fairbanks Company, New York.
3. Motley Green & Co., New York.
4. Niles-Bement-Pond Company, New York.
5. Manning, Maxwell & Moore, New York.
6. F. S. Pants & Co., New York.
7. Fox Bros. & Co., New York.
8. J. B. Kendall, Washington, D. C.
9. Royce & Ricketts, Washington, D. C.
10. Arthur O. Norton, Boston, Mass.
11. M. G. West & Co., San Francisco, Cal.
12. Holliday Machinery Company, South Seattle, Wash.
13. Handlan-Buck Company, St. Louis, Mo.
14. C. T. Patterson & Co., Limited, New Orleans, La.
15. Woodward, Wight & Co., New Orleans, Pa.
16. J. W. Creger Agency, Philadelphia, Pa.
17. Belknap Hardware Mfg. Company, Louisville, Ky.

Class 1. Two steam hammers—Bidder 1, $2400; 2, $2460, alternate bid, $2420; 3, $2250; 4, $2088; 5, $2153.40; 7, $2278; 12, $2365; 13, $2150; 14, $2408.56.

Class 2. Radial drills—Bidder 1, $1658; 2, $1690; 3, $1459; 4, $1986; 5, $1754; 7, $1770.80; 9, $1630; 12, $2009.80; 13, $1820; 14, $1513.80; 16, $1670.

Class 3. Duplex grinding machines—Bidder 1, $208; 2, $224; 3, $133; 5, $540; 7, $210.84; 12, item 3, $122.10, item 4, $141.36; 13, $206.40; 14, $163.30; 16, item 3, $120, item 4, $140; 17, item 4, $93.36.

Class 4. Portable cylinder boring machine—Bidder 1, $419; 2, $424; 3, $435; 4, $430; 5, $540; 7, $444; 12, $597.42; 13, $675.

Class 5. Pipe and bolt cutting machines—Bidder 1, $1066; 2, $1184; 3, $410; 5, $1093.44; 7, $660; 9, $660; 12, $1298.10; 13, $1120; 16, $930.

Class 6. Twenty-four ratchet pulling jacks—Bidder 1, $133.80; 3, $186; 5, $288; 6, $381.60; 7, $173.76; 8, $397.80; 11, item 7, $198.60, item 8, $225; 13, $93; 15, $99.12.

Class 7. Ball bearing jacks—Bidder 1, $1200; 3, $1134; 5, $1020; 6, $1013.16; 7, $972; 8, $1030.80; 10, $948; 11, $1152; 12, $1095.48; 13, $1140; 15, $1020; 17, $1080.

The Block-Pollak Iron Company, First National Bank Building, Chicago, has purchased the old Continental Chain Works plant at East Chicago, Ind., comprising 6½ acres, and will convert it into a scrap iron yard. The buildings on the property may later be improved and used in connection with certain manufacturing projects. This move on the part of the Block-Pollak Company was necessitated by reason of the elevation of tracks on the Belt Line Railroad, which interfered with the company's yard at Fifty-second and Wallace streets.

Great Improvements at South Chicago.

There was authorized this week by W. E. Corey, president of the United States Steel Corporation, the expenditure of about $2,000,000 for some very important improvements at the South Chicago plant of the Illinois Steel Company. These include an additional blast furnace and seven 50-ton open hearth furnaces, which are to be completed in ten months.

There has been an extraordinary scarcity of steel in the Chicago district for some time, and it is to relieve this famine that the new works are being erected. The new open hearth furnaces will duplicate the open hearth steel plant built recently and fully described in *The Iron Age*. The furnaces will be in line with the group which has now been in operation for some time. The blooming mill capacity is ample to take care of the added steel capacity.

The new blast furnace will have a capacity of 550 tons per day.

The Pittsburgh Tube Company.

This company, whose present works are located on Second avenue, Pittsburgh, has bought about 2½ acres of land at Colona, Pa., located on the line of the Pittsburgh & Lake Erie Railroad, 27 miles from Pittsburgh, where it has broken ground for the erection of a new plant, which when completed will more than double its present capacity in the manufacture of butt joint and brazed tubing. The main building will be of brick and frame construction, 100 x 150 feet, which will contain the equipment for the manufacture of these products. There will also be two lean-tos, both of frame and brick, one of which will be 30 x 50 feet, to be used as a boiler house and the other 40 x 40 feet, to contain the brazing furnaces.

Orders have been placed for all the equipment for the new works, including contracts to the Erie City Iron Works, Erie, Pa., for 150 horse-power engines and 200 horse-power boilers. The company will build a number of houses to be occupied as homes by the employees. Its business in the manufacture of butt joint and brazed tubing was originally established in Pittsburgh in a small way, but has grown steadily in volume, making it absolutely imperative to secure larger capacity to fill its orders. The new plant will be modern in every detail and will have direct switching connections with the Pittsburgh & Lake Erie Railroad. It is expected to be completed and in operation about November 1.

With September 1 the opportunity expires of bidding "for the supply and delivery of steel and iron manufactured in the State of New South Wales for a period of seven years." It may be recalled that in the early months of 1905 the Agent-General in London of the New South Wales Government advertised for bids from concerns which would undertake to erect blast furnaces and steel works in New South Wales and enter into a contract to deliver finished iron and steel. Elaborate specifications had been prepared giving in detail the terms of the desired contract and enlarging upon the facilities offered for the establishment of an iron industry in New South Wales. A Government handbook accompanied the specifications, describing the deposits of iron ore in that country as very rich and valuable. It is understood that no bids have been forthcoming, and the presumption is that the Government of New South Wales will now consider the advisability of developing an iron industry under domestic initiative.

The power consumption of various styles of electric lamps has been estimated by Professor Davidge as follows: Incandescent lamps, 2.5 to 4.5 watts per candlepower; inclosed arc lamps, 2.5 to 4 watts; Nernst lamps, 1.5 to 2.5 watts; open arc lamps, 0.8 to 1.5 watts.

The Pittsburgh Construction Company.

This company, located at Pittsburgh, has about completed the erection of the new Pittsburgh station for the Wabash-Pittsburgh Terminal Railroad, which is the Pittsburgh division of the Wabash Railroad. The tracks entering the new freight station are elevated 40 feet above the ground, being supported on steel frame work extending from south of First avenue to Fourth avenue, a distance of 600 feet. This steel frame work is 102 feet wide, on which a freight shed about 40 feet wide and 300 feet long is being built. A double tracked extension is being built from the Fourth avenue end of the station to the Allegheny River to connect with a proposed bridge across this river which will allow the Wabash to enter Allegheny City. If this bridge is built the Wabash will probably establish large freight yards in Allegheny. Five thousand tons of steel were used in the steel frame work, which is about 1400 feet long, extending from the Monongahela River on the south to the Allegheny River on the north. The Jones & Laughlin Steel Company of Pittsburgh furnished this steel and it was fabricated by the McClintic-Marshall Construction Company, Pittsburgh.

The Pittsburgh Construction Company also has contracts for elevated work for the Chicago Junction Railroad and the elevated railroads through the stockyards in Chicago, in which about 15,000 tons of structural steel will be used. It further has under erection the Atlantic avenue viaduct in Boston, the building of a number of bridges for the Nickel Plate Railroad at Cleveland, and also the Pennsylvania State bridge at Ulster, Pa., which will be 2000 feet long and will require about 1500 tons of steel. Other contracts include extensive alterations and construction work for the Louisville & Nashville and the Chesapeake & Ohio railroads at Cincinnati.

The American Ferrofix Brazing Company, brazer of cast iron, which was incorporated some time since under the laws of the State of Connecticut, has increased its capital from $50,000 to $575,000, divided into $225,000 preferred and $350,000 common stock, and has purchased all the patent rights and assets of the American Brazing Company together with the charters of the Ferrofix Brazing Company of Philadelphia, Scranton and Pittsburgh, Pa., and the New York Brazing Company, with a plant in New York City. These plants will be continued in operation under the new company and new ones will be erected and patent rights of the process employed will be sold in different sections of the country. The officers of the company are: Edgar W. Baird, president; F. B. Adams, vice-president; C. H. Werner, secretary; H. B. Haven, assistant secretary and assistant treasurer. G. Herbert Taylor is treasurer and general manager, and the executive offices of the company are located at 813-A. Arcade Building, Philadelphia, Pa.

The Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, Pa., states that, owing to improved facilities for manufacturing, it has decided to make a reduction in the price of Taylor-Newbold saws for sawing large forgings and other forms of steel. This change in price will take effect on all orders hereafter placed, but, of course, it does not affect any business already in hand. On new orders six extra teeth will be furnished with every saw. The price of large teeth has been slightly increased, as found necessary to pay for the air hardening steel, the waste in forging and machining and the cost of properly treating. The price of teeth up to ⅝ inch remains unchanged.

The Niagara, Ontario & Lockport Power Company expects to be delivering Niagara Falls electric current at Lockport within 30 days and to the Lackawanna Steel Company's plant, South Buffalo, in about two months. Temporary cables have been stretched across the Niagara gorge connecting with the Ontario Power Company's new plant on the Canadian side, but permanent cables will soon be in position.

OBITUARY.

E. A. WHEELER.

Earl A. Wheeler, retired coal and iron operator, former member of the Pennsylvania State Legislature and one of the pioneer residents of the Shenango Valley, died suddenly August 20 at Sharon, Pa. He was born in Brookfield Township, Ohio, September 28, 1828, spent his early life there, and removed to Sharon in 1848, after learning the tinner's trade in Warren, Ohio. He opened the first tin and stove store in Sharon and continued that business until 1862, when he began operating for coal, which he successfully followed for ten years. He then organized and built the Wheeler Iron Company furnace at West Middlesex, now owned by the Cherry Valley Iron Company. Mr. Wheeler was the inventor of the Wheeler vertical water tube boiler, which has been adopted by manufacturing plants and blast furnaces all over the country. He was a director of the Sharon Savings & Trust Company and was heavily interested in the Sharon Boiler Company and the American Tri-Motor Company. He was elected in the fall of 1869 to the Pennsylvania Legislature and re-elected in 1870. During his last term he introduced the first high license law, known as the "Mercer County Ironclad," which, though then unpopular, was the entering wedge of the present day temperance agitation in the State. He is survived by a widow and daughter.

Professor Wedding details in *Stahl und Eisen* tests carried out by him to ascertain the cause of a serious flaw in a large ingot of open hearth steel intended for a marine shaft. The mold was 5 feet high and at the base of the ingot 22 inches in diameter. The section was octagonal, with incurved sides, and the upper part of the head was conical for about 18 inches in hight. The steel was poured from above and it was covered with glowing charcoal to retain the heat as long as possible. As the ingot seemed perfect it was drawn out to a total length of 21 feet 10 inches and placed on the lathe. In turning it down to size some slight flaws were seen about 5 inches from the end. It was removed from the lathe and lightly struck, when, without any sign of explosive force, the top end broke off, exposing a flaw about 6 inches across. The appearances and tests indicated that the cavity had been filled with gas not liable to cause oxidation, and thus probably hydrogen or carbon monoxide. Analyses and tests of the metal are given, and it is pointed out that the flaw was probably caused by the faulty shape of the ingot mold and owing to insufficient heat of the metal when pouring. It is suggested that if this form of mold is retained it would be better to employ a hotter metal and to subject the casting to pressure during cooling.

An old pair of engines with a most interesting history, which are still running with remarkable smoothness, are referred to in a letter to *Graphite*, as follows: "In 1844 Mr. Polk was elected President of the United States. The next Congress passed an act to build a navy yard in the interior of the country, where foreign vessels could not safely reach it. Memphis, Tenn., was selected as the site. One double horizontal engine, with 14 x 42 inch cylinders, both connected with the main shaft and running at 58 revolutions per minute, was put in to run the machinery. When the war commenced the Confederates took these engines to Nashville and put them into a gun factory. After the fall of Donelson the Federals took the engines from the works and set them up in the railroad shops, where they were used until 1865. They were then put up at auction and were bought by the Nashville, Chattanooga & St. Louis Railway. When the new shops were built they were put in to drive all the machinery in the engine shop, and by rope transmission the boiler shop and blacksmith shop, and are running 23½ hours out of the 24 and 365 days in the year. Recently, while the writer was showing some visitors through the works, he stood a nickel on edge on the bed plate and it was standing there when they left the engine room." Our only comment is that the visitors must have been honest.

New York Pig Iron Warrant Market.

The sales in the pig iron warrant market in the Produce Exchange amounted to 1600 tons during the week ending at noon Wednesday. The prices in some cases were higher than those established on call last Wednesday noon and the transactions were as follows: 100 tons September, regular, $15.50; 100 tons November, foundry, $15.95; 100 tons September, regular, $15.50; 100 tons December, regular, $15.85; 100 tons December, foundry, $16; 100 tons October, foundry, $15.90; 100 tons September, regular, $15.30; 300 tons September, regular, $15.40; 300 tons October, regular, $15.50; 100 tons September, foundry, $15.35; 100 tons September, regular, $15.25; 100 tons November, regular, $15.40. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$15.50	$16.00	....	....
August	15.50	15.50	$15.50	$16.00
September	15.45	15.60	15.50	16.00
October	15.55	15.90	15.60	16.00
November	15.55	15.90	15.60	16.10
December	15.50	....	15.60	16.10
February	15.50	16.00	16.00	16.25

The University of Wisconsin, at Madison, Wis., has issued a bulletin describing the courses in mechanical engineering and gas engineering which have been adopted recently by its engineering college. It is stated that there has been an increasing demand for graduates of the engineering college who in addition to their engineering training have a knowledge of chemistry. The course in chemical engineering has been laid out so that the student can have a grounding in the principles of mechanical, civil or electrical engineering and add to this a foundation knowledge of the principles of chemistry. A five-year course is offered, but for the present the fifth year is not obligatory. At the end of four years the student may receive the degree of bachelor of science, but if he completes the five-year course he will receive the degree of chemical engineer. The University of Wisconsin also announces a series of optional studies which, if taken in connection with the studies of the mechanical engineering course, will afford a training in gas engineering. A course of lectures is provided, too, for students desiring to specialize in the sugar beet industry.

The vertical motor has open to it a large field of application in modern industrial plant work. By its use it is possible to do away with turned belts, bevel gears or other means of transmitting power from a horizontal to a vertical shaft. Frequently the driven machine may be made more compact in arrangement and greater economy in operation is secured because there is less friction than in ordinary means of power transmission. The Northern Electrical Mfg. Company, Madison, Wis., has paid special attention to the development of vertical motors and in its designs claims to have eliminated the troubles commonly attending the lubricating of a vertical armature shaft. Where required the Northern single voltage system for variable speed is applied to the vertical motors, so that the machines driven may be run at the speeds best suited to the work done by them. Simple controlling devices are used and the current may be taken from an ordinary two-wire direct current circuit.

Recent developments in the German machinery industry are referred to in an article in the *Journal of the Society of Arts*. It is stated that many new machine shops have been erected and old plants enlarged in late years, the estimate being made that the total capacity has more than doubled since 1890. According to a report of the United German Engine Manufacturers, numbering about 160 of the most prominent makers, the value of the total exports of machines from Germany in 1904 amounted to about $64,000,000, a total expected, however, to undergo a considerable reduction by the new commercial treaties. To show the disparity between the tariffs of the different nations it is asserted that a steam engine of 3000 horse-power and of a value of $55,000 is subject to a duty of $2250 when introduced into Germany. When exported, however, to Austria, a duty is charged thereon of $9000; to Russia, $27,000; to Italy, $6000, and to Switzerland, $2600.

New York.

NEW YORK, August 30, 1905.

Pig Iron.—Only moderate sales are reported in this market, while a fair movement has taken place in New England. Prices continue firm. Eastern Iron makers complain that costs have been crowding upward steadily since the summer. We continue to quote for Northern Iron, at tidewater, $16.50 to $17 for No. 1 Foundry, $15.75 to $16.25 for No. 2 Foundry and $15.25 to $15.75 for No. 2 Plain. Southern Iron is selling on the basis of $15.50 to $15.75 for No. 2 Foundry.

Steel Rails.—There have been some heavy sales of Steel Rails, partly for delivery this year and partly for delivery during 1906. Among the former is an additional lot of 10,000 tons for the St. Paul and 10,000 tons for the Grand Trunk for delivery in Canada. Among the sales for 1906 delivery are 50,000 tons for the Santa Fé and 25,000 tons for the Missouri Pacific.

Cast Iron Pipe.—The most important lettings coming up in the near future are in this city and Richmond, Va., for which bids will be opened next week. This city will purchase 4000 tons of Small Pipe for Manhattan and Brooklyn, while Richmond will ask for prices on about 1000 tons. The general demand for Cast Iron Pipe keeps up very well, considering that the summer is so far gone. Prices are firmly held, carload lots still being quoted at $27 per net ton for 6-inch, at tidewater.

Finished Iron and Steel.—While inquiries are very heavy from railroad companies and others projecting extensive undertakings for this fall and winter, the week has not developed actual business of any consequence in this line. The outlook is exceedingly encouraging, however, and it is expected that with the coming of the fall months the placing of contracts will develop into activity. Manufacturers of Structural Shapes report a continued heavy demand from consumers of this class of material. Large consumers who have contracts with the mills report difficulty in securing their full quota on such shipments. Business in other branches of Finished Iron and Steel is fairly active, with a considerably improved demand for Steel Bars and Bar Iron. The Bar Iron manufacturers are securing quite an advance over the official price, and it would now be a matter of some difficulty to find one willing to sell on the basis of 1.64½c., at tidewater, in this vicinity. Usual quotations are $1 to $2 per ton higher. Quotations, at tidewater, for shipments from mills are as follows: Beams, Channels, Angles and Zees, 1.89½c. to 1.99½c.; Tees, 1.94½c. to 2.04½c.; Bulbs, Angles and Deck Beams, 1.99½c. to 2.09½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.69½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—A particularly strong demand is noted for Stove Plate, Wrought Pipe, Borings, Railroad Wrought and for No. 1 Machinery Cast for foundry purposes. Steel Scrap is in much stronger demand, with inquiries now in this market for about 20,000 tons. Consumers, however, are not yet willing to pay the prices asked by dealers, but as no large blocks of Steel Scrap are on hand the dealers are on their part not disposed to sell at anything like present quotations. The demand for Relaying Rails is active. Prices have again been advanced on quite a number of articles in our list and quotations for New York and vicinity are approximately as follows in gross tons:

Old Iron Rails	$18.00 to $18.50
Old Steel Rails, rerolling lengths	14.50 to 15.50
Old Steel Rails, short pieces	14.00 to 14.50
Relaying Rails	22.00 to 23.00
Old Car Wheels	16.00 to 17.00
Old Iron Car Axles	19.00 to 20.00
Old Steel Car Axles	17.50 to 18.50
Heavy Melting Steel Scrap	14.00 to 14.50
No. 1 Railroad Wrought	18.00 to 18.50
No. 1 Yard Wrought	15.00 to 16.00
Iron Track Scrap	15.00 to 16.00
Wrought Pipe	13.00 to 13.50
Ordinary Light Iron	9.00 to 10.00
Cast Borings	8.00 to 9.00
Wrought Turnings	11.00 to 12.00
No. 1 Machinery Cast	14.00 to 15.00
Stove Plate	11.00 to 12.00

Steel alloyed with 4 to 5½ per cent. of manganese becomes so brittle as to be readily pulverized under the hammer. A larger proportion of manganese, however, increases the ductility of the alloy until a maximum is reached at about 12 per cent. These higher percentages of the secondary metal have the further effect of rendering the material extremely hard. A peculiar feature of manganese steel is that the ductility follows a sudden cooling, which is the exact reverse of the treatment accorded carbon steel for the production of ductility by the annealing process.

Metal Market.

NEW YORK, August 30, 1905.

Pig Tin.—Dullness has characterized the week's operations in the Tin market and prices have sagged from day to day. This is not only true of the local market, but in London prices declined during the week. To-day, on the news of the signing of peace negotiations, the market in London has declined sharply £1 10., and New York has followed the lead by reducing quotations to 33c. for spot, a decline of 0.30c. since yesterday. London quotations are £150 5s. for spot and £149 12s. 6d. for futures. Sales for future delivery showed considerably more activity to-day. The monthly statistics for August will be watched with eager interest, particularly so as the arrivals so far this month have amounted to but 2962 tons. There are, however, 1960 tons afloat for American ports, but a large part of this tonnage will arrive after the 10th of next month.

Copper.—Higher prices have resulted from the week's operations in Copper. These have been brought about by the scarcity in spot supplies and the underlying strength of the situation. The larger consumers are well supplied with metal for present and future needs, so that the sales are chiefly confined to small lots. There is a small demand for round lots for delivery during October and November. Some consumers have expressed their willingness to buy for delivery during January, February and March, 1906, providing desired concessions from the present prices are offered. The probable effect of the signing of peace negotiations on the future of the Copper market is a matter of conjecture. It is undoubtedly true that the warring nations will need considerable metal to repair their equipment, but there is no undue haste about this, and it is the opinion of some that considerable time will elapse before they will be heavy buyers of the metal. Color is lent to this view by the fact that quotations on the London Exchange broke sharply £1, to £71 10s. for spot and £71 for futures. Best Selected grades are unchanged at £78. What little metal there is now bought for local consumption commands 17c. for spot deliveries of both Lake and Electrolytic and 15.60c. for Casting grades. Deliveries during October and the rest of the year can be obtained at 16.75c. to 16.87½c. Exports so far this month aggregate 18,530 tons.

Pig Lead.—A sharp advance has been made in the price of Lead, which now rules at 4.85c. to 4.90c., New York delivery. The market is also considerably higher in St. Louis, ruling at 4.77½c. The American Smelting & Refining Company has likewise advanced its quotation to 4.85c. for Shipment Lead in 50-ton lots. London shares the general advance and Soft Spanish Lead is quoted on that Exchange at £14 8s. 9d.

Spelter.—Business is dull, but the market is very firm and quotations have been advanced to 5.70c. to 5.80c. for spot, August and September delivery. This is in contrast to the St. Louis market, which has declined 5c. during the week, and telegraphic advices from that center to-day quote 5.55c. for prime Western Spelter. Advices from the Joplin district to the New York Metal Exchange are to the effect that a general decline of about $3 per ton has taken place in Zinc Ore. Some Ore is selling at $4 to $5 per ton less than last week. The London market for Spelter is slightly firmer at £25 12s. 6d.

Antimony.—The long continued strength in this metal has undoubtedly been broken by the peace negotiations and prices have been reduced on all grades. We now quote for immediate delivery: Cookson's and Hallett's, 14c. to 15c.; other brands, 12.50c. to 13.50c.

Quicksilver.—The price is unchanged at $40 per flask of 75 lbs. in 100-flask lots. The same condition prevails in London, where the quotation is £7 2s. 6d.

Nickel.—There is no special animation in the Nickel market and quotations remain unchanged at 40c. to 45c. for good sized lots.

Tin Plate.—The market is rather dull, but prices remain unchanged on a basis of $3.74 a box of 100-lb. IC Coke Plates, f.o.b. New York, or $3.55, f.o.b. Pittsburgh. In Swansea Welsh Plates have advanced to 11s. 10½d. Advices from there are to the effect that on August 12 the stock of Tin Plate there was 190,357 boxes, against 132,878 boxes at the same time last year.

In *The Iron Age* for August 10 was erroneously published an obituary notice of George M. Ludlow, president of the Moneyweight Scale Company and vice-president of the Computing Scale Company, Chicago. Mr. Ludlow, it appears, is not only not dead, but is enjoying good health. The deceased was George W. Ludlow, his father. We regret very much the commission of this error. The information came from what was assumed to be a reliable source.

Iron and Industrial Stocks.

NEW YORK, August 30, 1905.

Prices have fluctuated considerably during the week, the stock market having been dominated by the varying reports as to the possible result of the peace negotiations at Portsmouth, N. H. The announcement that the representatives of the Russian and Japanese Governments had arrived at a satisfactory basis was followed by a sharp upward movement on Tuesday afternoon, but it did not hold, being followed by realizing sales. The fluctuations on the most active stocks during the week ranged as follows: Locomotive common, 52 to 55; Colorado Fuel, 45½ to 47¾; Pressed Steel common, 44½ to 46½; Republic common, 20⅞ to 22⅜, preferred 87½ to 90; Tennessee Coal, 89⅜ to 91¾; United States Steel common, 36¼ to 37⅛, preferred 104 to 105¾. The last transactions in active stocks up to 1.30 p.m. to-day are reported as follows: Can common 11½, preferred 72½; Car & Foundry common 37⅜, preferred 101½; Locomotive common 52½, preferred 113; Steel Foundries common 9¼, preferred 39⅜; Colorado Fuel 45½; Pressed Steel common 45, preferred 97; Railway Spring common 37, preferred 100¼; Republic common 21¼, preferred 89½; Sloss-Sheffield common 91, preferred 107; Tennessee Coal 90¼; United States Steel common 37⅜, preferred 105⅛, new 5's 97⅝.

Dividends.—The Republic Iron & Steel Company at its meeting in Chicago on August 28 declared a quarterly dividend of 1¾ per cent. on the preferred stock. This is the first dividend declared by the company since October, 1903, prior to which time the company had paid 7 per cent. a year since 1899.

The Interstate Commerce Commission announces that it will take steps to increase the minimum percentage of air brakes used on freight trains. The amendment of March 2, 1903, to the Safety Appliance act provided that a minimum of 50 per cent. of the cars in each train should have their brakes operated by the engineer of the locomotive drawing the train. The same amendment authorizes the Interstate Commerce Commission, after a full hearing, to increase the minimum percentage of the cars equipped with air brakes. The commission considers that recent accidents involving loss of life and property caused by the "buckling" of freight trains demonstrate that such trains were not actually under the control of the engineer, as required by law. As a preliminary to an increase in the minimum percentage the commission has issued an order requiring railroads to furnish it information as to the number of freight cars in use and the number of such cars equipped with air brakes.

On interurban lines operating at high speeds it is the opinion of many street railway engineers that something stronger than the chilled cast iron car wheel should be used. The danger of flanges breaking is greatly increased under these conditions, and the steel tired wheel has been adopted as one solution of the difficulty. It is found that the cost of truing is minimized if the tire is turned up after each 40,000 or 50,000 miles of travel. The average cost of a chilled cast iron wheel is given at $6, which, with a service of 30,000 miles, makes the cost 20 cents per 1000 miles. Steel tires cost $12, with $1 for their application, and $1 for each of three turnings after runs of 50,000 miles each. This makes a total cost of $16 for a service of 200,000 miles, or only 8 cents per 1000 miles.

To transmit mail and express matter between Chicago and Milwaukee, a distance of 84.5 miles, a pneumatic tube 18 inches in diameter and laid underground all the way has been proposed. The system would be designed to carry loads up to a weight of 500 pounds and would be operated in relays of 2 or 3 miles each, power being automatically cut off from each section, or "block," as soon as the shuttle passed into the next one. Instead of forcing this shuttle through the tube by means of compressed air, as in other systems, a vacuum arrangement would be employed, by which it is estimated that the distance could be covered in about 40 minutes, or at the rate of some 125 miles per hour. The cost of such a plant complete is placed at $5,000,000, but the expenses of operation are expected to be so light as to allow the company to make a charge of not more than 15 cents for a package weighing 500 pounds.

PERSONAL.

It is understood that in view of the request of Vice-Presidents Geo. B. Leighton and W. D. Sargent to be relieved of office in the American Steel Foundries the directors of that company will accept their resignations at the meeting to be held on September 7. The expectation is that Robert P. Lamont will be elected first vice-president, W. W. Butler second vice-president and Geo. E. Scott third vice-president. All three held the same offices respectively in the Simplex Railway Appliance Company, the stock of which was acquired by the American Steel Foundries in February of this year. President William V. Kelley of the Simplex Railway Appliance Company was elected president of the American Steel Foundries at the last meeting of the directors.

J. R. McColl, who has been associate professor of steam engineering at Purdue University, Lafayette, Ind., has accepted a position on the engineering staff of the American Blower Company of Detroit, Mich.

W. H. Speller, formerly with the Wilcox Mfg. Company, Aurora, Ill., has become connected with the engineering department of the Weber Gas & Gasoline Engine Company, Kansas City, Mo.

O. E. Rea has accepted a position as engineer with the Vaughn & Bushnell Mfg. Company, Chicago. Mr. Rea was formerly mechanical engineer with the Illinois Steel Company.

H. Clay Evans, on his return to Chattanooga, Tenn., after an absence of about eight years as United States Commissioner of Pensions and Consul-General to London, will give his active attention to the Chattanooga Car Works. Mr. Evans has long been very actively identified with the iron interests of the Chattanooga district.

James A. Brady of Chicago has been employed by the Wilks Foundry Company, Toledo, Ohio, as superintendent, to take charge of its light workshop, it having become necessary to engage another superintendent on account of increasing business, which prevented C. T. Wilks giving the heavy foundry the time and attention which it required.

G. H. Schulte, vice-president and general manager of the Milwaukee Harvester Company before its sale to the International Harvester Company and general manager of the Milwaukee plant after the merger, has recently been elected a director of the J. I. Case Threshing Machine Company, Racine, Wis., and will be in active charge of the manufacturing department of the business. About a year ago Mr. Schulte withdrew from his active duties at Milwaukee, since which time he has traveled extensively.

J. A. Sherwood, who has for the past five years traveled in the Northern States and Canada for the Ewald Iron Company, St. Louis, has resigned from that firm and taken the position as sales manager in the E. S. Jackman Agency of the Firth-Sterling Steel Company in Chicago. Previous to his association with the Ewald Iron Company Mr. Sherwood was for 13 years in the tool steel business with leading Pittsburgh manufacturers.

Robert L. Livingston has accepted a position with the Engineering Company of America, and will make his headquarters at 74 Broadway, New York. Mr. Livingston formerly was connected with the Allis-Chalmers Company and recently with W. S. Barstow in electrical engineering work.

The Allan F. McIntyre Company, Monadnock Block, Chicago, has been appointed Chicago agent for the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, manufacturer of refined charcoal bloom staybolts, both hollow and solid.

The firm of Frazier, Fox & Spencer, consulting engineers, has been formed at Cleveland, Ohio, with offices at 718 Rockefeller Building. J. W. Frazier and J. H. Fox have been connected for about six years with the Brown Hoisting Machinery Company of Cleveland in the designing and contracting department. J. C. Spencer was connected for several years with the engineering and designing department of the American Bridge Company, and for the past year has been practicing as a consulting architectural engineer, with offices in Cleveland. The new firm will devote itself to bridge designs, estimates, examinations and reports, to steel frame buildings, light, heat, power and industrial plants, also to equipment for handling and storing coal, ore and merchandise.

Announcement of several appointments effective September 1 has just been made by the Carnegie Steel Company: Albert M. Harper is made manager of sales for the Pittsburgh district, with offices in the Carnegie Building; John E. Woods, at present assistant general manager of sales at Pittsburgh, has been appointed manager of sales for the Cincinnati district, to succeed W. H. D. Totten, Jr., who has resigned. The following assistants to the general manager of sales have been appointed: William P. Siebert, assistant general manager of sales, in charge of rail and billet division; William G. Clyde, assistant general manager of sales, in charge of hoop and bar division; John C. Neale, assistant general manager of sales and structural engineer, in charge of structural and plate division.

James Duane has been appointed by the Northern Iron Company as superintendent of the Standish Furnace, Standish, N. Y., and will take charge of it when repairs now in progress are completed.

Reginald Holder of Hull, England, a member of the Jessop Steel Company, and S. Tucker, a chemist of Sheffield, England, have arrived in Pittsburgh, and will spend some time in that city studying American methods of making steel.

John P. Shaddock, formerly superintendent of the plate mills of the Homestead Steel Works of the Carnegie Steel Company, but more recently with the National Tube Company at Lorain, Ohio, has resigned to become general superintendent of the open hearth steel plant of the Alabama Steel & Wire Company at Gadsden, Ala.

Labor Notes.

Union molders in the employ of Fairbanks, Morse & Co., Beloit, Wis., recently presented demands for a change in the method of handling foundry work and went on a strike pending the consideration of their demand. In brief, the strikers asked that as certain jobs in the foundry had been reduced in time in the two years previous all jobs should be placed on the original footing as to time. The firm was also asked to have its foreman "treat the men with more consideration when the men are doing a fair and just day's work." Wages asked for core makers were 30 cents an hour and 27½ cents an hour, respectively, for the two classes. In view of the fact that for more than two years the company has been improving its plant and at great expense equipping the foundry with labor saving devices, compliance with the demand of the union would have meant a loss of the benefits to be derived from this investment. An official of the Molders' Union who investigated the matter refused to uphold the local union, and the men were ordered to return to work, with the promise that they would be assisted by the national official in drawing up a new statement of grievances.

Indications are that the strike ordered some time ago by the International Association of Bridge and Structural Iron Workers against the American Bridge Company will be settled in a short time. Officials of the American Bridge Company claim they were not responsible for the strike and that it could have been avoided had the representatives of the Bridge Workers' Union followed the terms of the agreement and held a conference with officials of the American Bridge Company before the strike was started.

The statement that there will be a readjustment of wages among employees of the hoop mills of the Carnegie Steel Company at Youngstown, Ohio, on August 28, is officially denied.

New Publications.

Modern Gas Engines and Producer Gas Plants. By R. E. Mathot, M. E. Translated from the original French manuscript by Waldemar B. Kaempffert. Pages, 300. Illustrations, 175. Norman W. Henley, Publishing Company, New York. Price, $2.50.

The author is a Belgian engineer who has made a specialty for years of testing and reporting upon gas and oil engines and gas plants in general. He discusses the gas engine from the standpoint of the best practice in the United States and Europe and has aimed to make his book a guide to the gas engine designer, user and engineer. He deals with the construction, selection, installation and operation of gas engines, aiming to give the users of gas engines an understanding of the motor on which they depend. The explosion of the mixture in the cylinder at the exact moment the piston starts on its working stroke, that the full effect of the expansion of the gas be obtained, is a well-known essential, yet a slight perturbation will cause a material waste in power. The author has presented in admirable form, without elaborate mathematics or statements of theory, the elementary facts concerning the gas engine and its operation, the care it should have if its efficiency is to be maintained and the manner in which repairs should be made. A feature of the book is the treatment at some length of the generation of producer gas and its utilization in gas engines. Attention is given to the suction gas generator, the construction of which has been so markedly improved of late as to suggest its more general introduction in the near future even for moderate and small powers.

The author advocates a more extensive use of high pressures. The accidents resulting from such pressures, he holds, are due to the improper application of high pressures. They cannot be employed in cylinders not specially designed for them. "This is the case with most engines of the older type, among which may be included most engines of English, French and particularly American construction. In American engines notably the explosion chamber, the cylinder and its jacket are generally cast in one piece, so that it is very difficult to allow for the free expansion of certain members with the high and unequal temperatures to which they are subjected." German engine builders are leading in the matter of increased pressures, having adopted for producer gas engines pressures of 114 to 170 pounds per square inch, and in some cases more.

Some of the claims made for the earlier gas engines quite exaggerated the factor of little or no care in exploiting the economies of these motors. Mr. Mathot's book will do its share in counteracting the harm done by these unwise statements. He has produced a work of high everyday value.

Coke. A Treatise on the Manufacture of Coke and Other Prepared Fuels and the Saving of By-products. By John Fulton. 8vo; pages, 498. International Text Book Company, Scranton, Pa. Price, $5.

The first edition of Mr. Fulton's book on the evolution of coke manufacture in the United States was published in 1895. This second edition contains a considerable body of additional material, particularly relating to the development in the coke industry in the past ten years. The author says that the progress made in that time has retired some of the former methods employed in the manufacture of coke and has introduced many new ones. The advance made has been due particularly to the expansion of the iron industry, with its demand for a high quality of coke for blast furnace use. Since 1895 coking operations have been extended beyond the original fields containing the best coking coals to districts possessing coking coals of a lower grade. Thus it has become necessary in connection with coke manufacture to provide means for cleansing the coals before coking and in this field mechanical experts have made important progress. The necessity of disintegrating the lumps and classifying the crushed product as it has been conveyed to washers has introduced new machinery, and it is now possible to utilize the lower grades of coal in the economical production of an acceptable metallurgical fuel. The author treats at length of the advance of the retort coke oven in recent years. The high cost of installation, with the heavy expense of apparatus for saving the by-products, has prevented the more general introduction of the retort oven. Such a plant requires a guaranteed supply of coal for a long period at low freights, in view of the large investment in plants. Only certain localities can be assured of a continuous supply under these conditions and therefore the retort oven is not practical in all districts.

The progress made in by-product oven construction in the United States and in Europe is detailed and patented improvements of recent years are described, with comparisons of the various systems and the results obtained. The author has drawn upon the proceedings of various engineering societies and upon the columns of the technical press for much of his summary of progress in by-product lines in the past ten years. It is unfortunate that the statistics of by-product ovens in the United States do not extend beyond 1902, as 1903 and 1904 were years of important additions. A chapter is devoted to the fuel briquetting industry, which particularly details European practice. The author has depended to a considerable extent upon reports by United States consuls, some of which can scarcely be considered sufficiently accurate to find a place in a work which sets out to be authoritative. Reference is made to a number of patents on briquetting processes issued in the United States, but the author questions the commercial success up to this time of efforts in this direction. He says, however, that the results obtained in foreign countries from the use of lignite and peat in briquetted form should encourage producers in the United States to try similar methods of manufacture. He believes that the time is not far distant when our neglected fuel resources, including the fine anthracite of culm banks and the slack now wasted at many bituminous mines, will all be utilized. The index in the present volume is a valuable addition. The excessive paragraphing of the first edition, nearly every sentence being a separate paragraph, has been remedied, with great improvement in the appearance of the book. Some excellent new matter has been introduced in the chapter on the preparation of coals for the manufacture of coke. It is to be regretted that some of the errors, particularly in the names of well-known experimenters, that appeared in the first edition are carried over into the revised volume.

Geology of Western Ore Deposits. By Arthur Lakes, formerly Professor of Geology in the Colorado School of Mines. Second edition. Pages, 438; 6 x 8¼ inches. Illustrations, 300. Kendrick Book & Stationery Company, Denver, Col. Price, $2.50.

The first edition of this work was published about 10 years ago under the title "Geology of Colorado and Western Ore Deposits." The present edition is much larger and its scope has been broadened. The author has sought to illustrate the principles of mining geology rather than to enlarge on any particularly noted mine. He gives preference to Colorado mines because of his familiarity with them, but illustrations are drawn also from properties outside that State. The first part of the book deals with general features of mining geology, then follow illustrations of these drawn from Colorado's mining camps, with further illustration and confirmation from noted mining camps of the Western States. Referring to iron ores the author says that much of the magnetite of Colorado is of little value because of the high percentage of titanic acid, and the limonite of the plains and foothills often carries too much phosphorus and too much silica. The heaviest and best deposits of magnetite are in Gunnison County. An interesting chapter is that on the theory of ore deposits. Most of the work is devoted to ore bodies in place. A glossary of 23 pages is given and an appendix containing valuable geological maps of the Cripple Creek and other mining districts. The author's style is clear and his descriptions are lucid, giving the work high value as a manual.

HARDWARE.

IN placing orders for goods a merchant should exercise as much care as he would in making credit sales. As a rule in making sales on credit he inquires very closely into the financial standing or the personal reputation of the customer, and does not hesitate to refuse to do business with him if any suspicion arises as to his ability to pay the account. When the merchant is placing his orders, however, he too frequently takes it for granted that the party with whom he is dealing is in a position to furnish the goods in the time designated in the contract, and, further, that the articles thus ordered will prove to be of the quality which is expected. The inducement of a lower price is an appeal to the business sense of the buyer which he feels he cannot well disregard, and it tempts him to take the risk of securing what he supposes he is buying and its delivery on time, even though he knows little of the resources or reputation of the seller. The merchant who permits himself to be governed habitually by prices, without exercising a fair degree of caution as to the character or responsibility of the seller, may be so fortunate as to find himself well served, but the chances are that he will at least occasionally be placed in an uncomfortable position. When he is in greatest need of a certain class of merchandise, for instance, the shipments are so slow that he is unable to supply his trade, because the party holding his orders is loaded up too heavily or is shipping largely to other buyers whose purchases are yielding a greater profit. Again, on some lines in which quality is a very important consideration he is deluged with complaints from his customers that what they are getting is not giving satisfaction. Complaints of this character are as apt to occur in connection with staple goods as with specialties. Sheets, Tin Plates and Nails can fall short of the approved standard as well as Edge Tools and Sewing Machines.

As far as it is practicable for a merchant to do so he should conduct his buying upon similar principles to those followed by successful manufacturers. Those who conduct important manufacturing undertakings are not wholly influenced by the question of price when purchasing supplies of materials. They inquire closely into the resources and business reputation of all new or untried candidates for their trade. As contracts for factory products must be filled on time, it would be hazardous to rely for deliveries of essential materials upon one who might overestimate his producing capacity or would make deliveries of materials not up to the standard, trusting to have them slip through. Opportunities to make apparently quite a heavy saving in the cost of producing manufactured articles are known to be passed from time to time by manufacturers having a reputation which they carefully guard rather than take some risk of disappointment in their purchases of materials. The size of the seller is by no means a governing consideration in this question. A small manufacturer or a small jobber is as likely to fill orders commensurate with the size of his business as a very large manufacturer or jobber. It may, in fact, frequently happen that the small house will take greater care to fill an order exactly according to the buyer's requirements than the large house with a hundred times as many customers. In such cases the building up or maintenance of a reputation for promptness and fair dealing offsets the difference in capital. While it is exceedingly desirable for a merchant to buy cheaply, yet buying at the lowest prices is not an invariable indication of shrewdness.

Condition of Trade.

Now that the vacation season is practically at its end, employers and employees will resume their places and take up their regular work, relieving those who have, each in his turn, been doing double duty. It will also make a marked and desirable improvement in the care and promptness given to correspondence as well as to the general conduct of business. When buyers have had time to familiarize themselves with requirements and to place orders it is anticipated that the volume of business will show further improvement. It is thought that manufacturers in general will not make changes in prices unless raw material advances in a marked degree. Reports from the South and Southwest regarding cotton and corn crops are encouraging. The spread of yellow fever from New Orleans to other points in the State of Louisiana is interfering with business. The market for Copper and Brass Goods shows a stiffening all along the line.

Chicago.

August is usually a dull month in the local Hardware trade, both jobbing and retail, but this year business is continuing to come in at a lively rate, and shipments from jobbers' warehouses to both city and country merchants are highly satisfactory. There are evidently powerful influences at work to strengthen the market on Wire and Wire products, and, as we have noted before in this report, buyers are being advised by their friends among manufacturing interests to lay in rather liberal stocks, because there is but little possibility of prices going lower than they are now, and a very great probability that they will go higher. The same is true of Cut Nails, which follow the Wire Nail market very closely, but which are now offered at about 15 cents below the Wire Nail price. Makers of Builders' Hardware are from four to eight weeks behind in their deliveries of special design orders and are also crowded with business for stock designs, particularly in the medium priced grades such as go into flats and houses to rent. The demand for Galvanized Iron, Aluminum and Bronze Wire Cloth is growing. Fall trade on Pipe, Elbows and Hods is above the average. The demand for Stove Boards is heavy, but they are sold at no profit by the jobber. Preparations are being made to supply the largest demand in the history of the country for Corn Huskers. Axes are selling better than was expected at the advanced prices now in vogue. Mechanics' tools are moving well. Sheets are still weak, but there is a disposition on the part of both jobbers and retailers to watch the market carefully, with a view to covering at the first sign of the advance, which is looked upon as inevitable. This is particularly true of Galvanized Sheets. A good business is being done in Eaves Trough, Conductor Pipe, Furnace Pipe, Fittings and Registers, and the demand for Stoves is spoken of as highly satisfactory.

NOTES ON PRICES.

Wire Nails.—The demand is excellent for the season and is increasing. Prices are being maintained better than for some time, owing to the efforts of manufacturers in this direction, including the restriction of production as far as possible to actual trade requirements. Manufacturers anticipate a fall business of such proportions that it will be difficult to make shipments promptly. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carloads to retailers	1.85

New York.—Local demand is keeping up to a satisfactory degree for small lots from store. The market is firm at the following quotations on the basis of $1.95 to $2 for small lots from store.

Chicago, by Telegraph.—Wire Nails are unchanged in official price, but instead of this price being shaded quite considerably to jobbers, as was the case some time

ago, the general tendency is to hold for better figures and the opinion prevails that it will not be many weeks before full official prices will be obtained. The official schedule is on the basis of $1.95 in car lots to jobbers, $2 in car lots to retailers, with 5 cents advance for less than car lots from mill. Price from jobbers' store in small lots is unchanged at $2 to $2.05, base.

Pittsburgh.—The efforts of the manufacturers are being concentrated in restricting production to meet actual business as far as possible and in maintaining prices with considerable benefit to the market. There is a steadily increasing demand for Wire Nails and the tone of the market is fairly strong, concessions in prices being the exception and made only on desirable orders and to certain competitive points to which some mills have a low rate of freight. We quote Wire Nails at $1.80 in carloads to jobbers, f.o.b. Pittsburgh, plus actual freight to point of delivery.

Cut Nails.—Some improvement in the number of contract orders for forward delivery is noted, as large buyers do not look for much lower prices. The market has not gained in strength and quotations are $1.60, base, for carload lots, f.o.b. maker's mill. This price could possibly be shaded on desirable orders. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at about $1.70, base.

New York.—The market remains in about the same condition as for some time, the demand being moderate. Quotations for small lots from store are on the basis of $1.90 to $1.95.

Chicago, by Telegraph.—Prices are unchanged, but are firmer in tone. We quote actual prices rather than official, as official prices on Cut Nails are no longer a factor. The current market prices at Chicago are as follows: To jobbers, f.o.b. Chicago, in car lots, $1.75, base; retailers, car lots, $1.80, base; less than car lots from mill, $1.90, base; small lots from store, $2, base.

Pittsburgh.—A fair amount of new business is being placed in Cut Nails, some of the larger trade placing orders for delivery ahead on account of the low prices ruling and in the belief that the market is about as low as it will go. We quote Cut Nails at $1.60, base, in carload lots, f.o.b. maker's mill, but on desirable orders this price might be shaded 5 cents a keg. Iron Cut Nails are held at $1.70 per keg in carload lots.

Barb Wire.—There is a seasonable demand, with prospects of an increase in this direction. The market is stiffening up, and concessions from official quotations are more difficult to obtain. Official quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago, by Telegraph.—Important selling factors in this market are positive in their assertions that the considerable concessions below the official figures on Barb Wire which have been made are no longer obtainable and it will not be long before full official prices are obtained. The official schedule is as follows: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The very heavy Western crops give indication that the farmers will be liberal buyers of Barb Wire when they have moved their crops and have time to make betterments. Demand is seasonable for this time of the year, with excellent prospects for a large fall trade. Prices are fairly firm and in the main are being observed. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers less than carload lots	2.10	2.40

Smooth Fence Wire.—Purchasers are coming into the market with liberal orders, which they are placing with the mills. The market is generally firm at the following quotations, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—The tone of the market is a little firmer than it has been and the heavy concessions that were made during the early period of the contracting season are not obtainable to-day, the period approaching when official prices will be paid. Official prices are on the basis of $1.80 for Annealed, car lots to jobbers, and $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—Demand for Fence Wire is quite active and the mills have about all the business they can handle. Outlook for a heavy fall trade is good, prices being quite firm, and are shaded only to slight extent to certain points of delivery. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Lawn Mowers.—From all advices and reports received it would appear that the past season's trade in Lawn Mowers has been highly satisfactory both to manufacturers and merchants. The former almost universally report a record business, demand exceeding capacity in many cases, while the latter with few exceptions are carrying over a very small number of machines. Thus there has been little or no inducement for either to close out stock at reduced prices. The opinion prevails that the amount of attention given to lawn cultivation by municipal commissions, clubs and other organizations as well as private householders is yearly increasing, while the widespread popularity of the game of golf, with its requirements in this regard, has had no inconsiderable effect in enlarging the consumption, especially of horse machines. An encouraging feature of the year's business has been that the greatest increases in factory output have been found in machines of higher efficiency and better grade; but there has been a noticeable demand, especially from the larger jobbing trade, for the cheapest Lawn Mower that could be produced, which they have placed on the market, usually under private brands, very close to cost. The efforts of various manufacturers to increase their share of this business for the coming year may lead to some unsettlement in the market, as will also the fact that there are several new manufacturers in the field.

Rope.—Manufacturers report a continuance of fair demand, with prospects of a good business for the coming season. The market for Manila Hemp is firmer in tone, while Sisal Hemp has advanced slightly. The market remains irregular in so far as card prices are not usually obtained. General quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound, the above figures being shaded ¼ to ½ cent per pound, according to seller and buyer.

Linseed Oil.—The demand for small lots of Oil is light from all classes of buyers, who are keeping stocks down as low as possible in anticipation of lower prices. Some contracts have been placed for delivery after October 15 forward to and including January at 38 cents. The majority of buyers are holding off, owing to the difference in their views and those of the crushers as to prices. The market is firm, and New York quotations for prompt deliveries are as follows: City Raw, 54 to 55 cents per gallon; State and Western Raw, 52 to 53 cents per gallon, according to quantity.

PRICES OF SHEET COPPER.

Sizes of sheets.		96 oz. & over. 75 lb. sheet. 30 x 60 and heavier	64 oz. to 96 oz. 50 to 75 lb. sheet, 30 x 60	32 oz. to 64 oz. 25 to 50 lb. sheet, 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet, 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet, 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet, 30 x 60.	12 oz. and 13 oz. 9½ to 11 lb. sheet, 30 x 60.	10 oz. and 11 oz. 7¾ to 9½ lb. sheet, 30 x 60.	8 oz. and 9 oz. 6¼ to 7¾ lb. sheet, 30 x 60.	Lighter than 8 oz.
		Cents per pound.									
Not wider than 30 inches.....	Not longer than 72 in...	20	20	20	20	20	21	22	23	26	29
	Longer than 72 in.... Not longer than 96 in.	20	20	20	20	20	21	23	26	29	....
	Longer than 96 in.....	20	20	20	20	20	22	26	....	....	....
Wider than 30 inches but not wider than 36 inches.....	Not longer than 72 in...	20	20	20	20	20	22	24	27	30	....
	Longer than 72 in..... Not longer than 96 in.	20	20	20	20	20	22	26	29	....	....
	Longer than 96 in..... Not longer than 120 in.	20	20	20	20	21	23	....	....	....	....
	Longer than 120 in.....	20	20	20	21	22	....	....	....	....	....
Wider than 36 inches but not wider than 48 inches.....	Not longer than 72 in ..	20	20	20	21	22	24	27	30	....	....
	Longer than 72 in..... Not longer than 96 in.	20	20	20	21	23	25	28	....	....	....
	Longer than 96 in .... Not longer than 120 in.	20	20	20	22	24	28	....	....	....	....
	Longer than 120 in.....	20	20	21	23	26	....	....	....	....	....
Wider than 48 inches but not wider than 60 inches.....	Not longer than 72 in...	20	20	20	21	23	26	31	....	....	....
	Longer than 72 in .... Not longer than 96 in.	20	20	20	22	24	29	....	....	....	....
	Longer than 96 in..... Not longer than 120 in.	20	20	21	23	26	....	....	....	....	....
	Longer than 120 in.....	21	21	22	24	28	....	....	....	....	....
Wider than 60 inches but not wider than 72 inches..	Not longer than 96 in...	20	20	21	23	28	....	....	....	....	....
	Longer than 96 in..... Not longer than 120 in.	20	20	22	25	30	....	....	....	....	....
	Longer than 120 in.....	21	21	23	28	....	....	....	....	....	....
Wider than 72 inches but not wider than 108 inches.....	Not longer than 96 in...	21	21	23	26	....	....	....	....	....	....
	Longer than 96 in..... Not longer than 120 in.	22	22	24	27	....	....	....	....	....	....
	Longer than 120 in.	23	23	25	29	....	....	....	....	....	....
Wider than 108 inches.....	Not longer than 132 in...	24	24	26	....	....	....	....	....	....	....
	Longer than 132 in.....	25	25	28	....	....	....	....	....	....	....

The longest dimensions in any sheet shall be considered as its length.

Circles, Segments and Pattern Sheets, 3 cents per pound advance over prices of Sheet Copper required to cut them from
All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.
Cold Rolled and Annealed Copper, Sheets and Circles, wider than 17 inches, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.
All Polished Copper, 20 inches wide and under, 1 cent per pound advance over the price for Cold Rolled Copper
All Polished Copper, over 20 inches wide, 2 cents per pound advance over the price for Cold Rolled Copper.
Planished Copper, 1 cent per pound more than Polished Copper.
Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

TINNING.

Tinning Sheets, on one side, per square foot, 2½ cents. For tinning both sides, double the above prices.
For tinning Circles and Segments, price is 2½ cents per square foot upon the square of the circle, *i. e.*, a 12-inch circle is considered one square foot.
For tinning the edges of sheets one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Sheet Copper.—Under date August 22 the manufacturers of Sheet Copper and Copper Bottoms announced new prices on these goods as per price-list given above.

Copper Bottoms, Pits and Flats.—The following are the prices announced under date August 22 by the manufacturers of Copper Sheets, &c.:

14 ounces to square foot and heavier, per pound.... 24c.
12 ounces and up to 14 ounces per square foot, per pound ..... 25c.
10 ounces and up to 12 ounces..... 27c.
Lighter than 10 ounces..... 30c.

Circles less than 8 inches diameter, 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1 cent per pound extra.

Window Glass.—There will be very little new Glass put on the market during September judging from present outlook, as but 10 or 12 of the factories identified with the Manufacturers' Association have started their fires. The trouble in the matter of the wage scale results from one workers' union holding out for a higher scale of wages than the other union is willing to accept. The union wanting the higher wages represents about 90 per cent. of the men employed in hand operated factories last year. The lower scale of wages is the one advocated by the Manufacturers' Association, so that the prospect for a speedy resumption of a majority of the Glass factories is not bright. Demand has slackened somewhat in view of the possibility of new Glass being on the market in large enough quantities to affect prices within a few weeks. Local quotations are as follows: The first two brackets of B single, 90 and 10 per cent. discount; all B sizes above, 89 per cent. discount; all A sizes, 88 per cent. discount.

Spirits Turpentine.—The steadiness of the Southern market during the week under review has had a depressing effect upon business at this point, as prices have remained too high to attract trade. Lack of demand has caused sellers to reduce prices slightly, and a limited quantity has been sold at the following New York quotations, according to quantity: Oil barrels, 62¾ to 63¼ cents; machine made barrels, 63¼ to 63¾ cents per gallon.

STANDARD CHAIN COMPANY.

IN answer to reports that the Standard Chain Company, Pittsburgh, was seriously crippled on account of its Chain works being closed down because of labor troubles, we are authorized to state that this company at the present time is operating to nearly full capacity five of its Chain plants located in various parts of the country. Only two of its works are idle, and the company expects to start these within a reasonable time. The five plants now running are operated on the open shop policy, labor unions of any kind not being recognized.

THE NATIONAL SWEEPER COMPANY, Marion, Ind., manufacturer of Carpet Sweepers, has recently opened a New York office, where its representative, I. J. Allen, will manage its metropolitan and Eastern business and its entire export trade. Handsome offices, with reception and display rooms, have been fitted up at 296 Broadway, where visitors will have every facility for selecting stock from complete samples running through a wide range of prices. Warerooms in connection with the offices will admit of immediate local deliveries and direct shipments in case of urgent necessity for prompt replenishment of dealers' stocks. The company states that this step was rendered necessary by the rapid growth of its business in this territory and the increased volume of its export trade. Further enlargement is expected from the improved facilities enjoyed.

OUR EXPORT TRADE.

BY VIATOR.

IT is conceded that the United States is the home of mechanical inventive genius. No other country can approach us in inventions of labor saving machinery. The bowels of our earth are laden with coal, iron ore, copper, &c., and the ingenious labor saving devices bring them to the surface at a smaller cost than in any other land and our lake, river and canal fleets as well as railroads bring them to the doors of the manufacturers at a less cost per ton than those of other countries.

An abundance of capital is at our command. If, say, Japan wants a paltry $50,000,000 or $100,000,000, at 4½ per cent., to build a navy, with which possibly to destroy our possessions in the East, it is a matter of 48 hours to open our vaults and let her have our gold.

The average manager of our manufacturing concerns works longer than those of other countries. He is at his desk about 9 o'clock, a telephone receiver at his left and a stenographer at his right, and works until 5 or 6 o'clock, with an intermission of a few minutes to take his dyspepsia producing quick lunch.

The Englishman arrives at his office about 10 a.m., locks himself in his private sanctum and receives his deputies. He lunches from 12 to 2 p.m., and goes home about 5.

The German takes his coffee and roll at 8, breakfasts at 10, takes his midday meal and sleep between 12 and 2, and goes home at 6, but in the interim. does not forget the brewer.

We have then the ability, cheap raw materials, low transportation, abundance of capital and the strenuous life.

According to the report of the Department of Commerce and Labor, we exported during the fiscal year ended June 30, 1905, of manufactured goods which came within the scope of *The Iron Age*, excepting machinery, the following:

Iron and steel	$134,727,921
Agricultural implements	20,721,741
Manufactures of brass	3,025,764
Carriages, cars and vehicles	10,610,437
Manufactures of copper	86,225,291
Total	$255,311,154

Are we getting our share of the trade of the 426,000,000 Chinese, the three hundred odd millions in India, the 129,000,000 Russians, 46,000,000 Austrians and 40,000,000 Japanese, not taking into consideration all the other countries? In the six countries named above alone there is a population of some 989,000,000, while our total exports to all countries are only $255,311,154. May not the United States reasonably aspire to sell each of these people $1 worth of goods per year, and thus bring up our exports to, say, $1,000,000,000? But we are content to do our business through the commission houses in the ports of New York, Boston, New Orleans, San Francisco, &c. We are sending tons of catalogues, circulars, &c., through these commission houses in English, which the great majority of recipients cannot read, and thus if orders follow it is the exception. To make this plain we will suppose that some enterprising manufacturer in, say, Odessa invented some article of great merit and mailed a Russian descriptive circular, accompanied by the Russian letter, to our merchants. What would be the result? Our literature to yield reasonable results should be in the language of the country to which it is sent.

Then, too, the peculiarities and tastes of the various peoples should be studied. To illustrate: Several years ago a German manufacturer consigned to a New York importing house in which I was interested several hundred dozen Bone Handle Pocket Knives, with an inlaid cross. They could not be sold in this country at any price. One day a Mexican buyer noticed the Knife, asked the price and how many we had and took the lot. So the cross, the emblem of his faith, sold the Knives.

Then, too, Congress should give us a helping hand, for every ton of freight we ship in foreign bottoms is a tribute to our competitors.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

WINDOW SCREEN ADVERTISING.

DURING the summer the Barrett Hardware Company, Joliet, Ill., has devoted considerable advertising space in the local papers to Self Fitting Screens. One of the ads., reduced one-half, is reproduced herewith. It will be recognized as an intelligent and effective presentation of the merits of the screen. Another ad. of about the same dimensions, headed "Burglar Proof Screens," briefly discussed the protection afforded by the

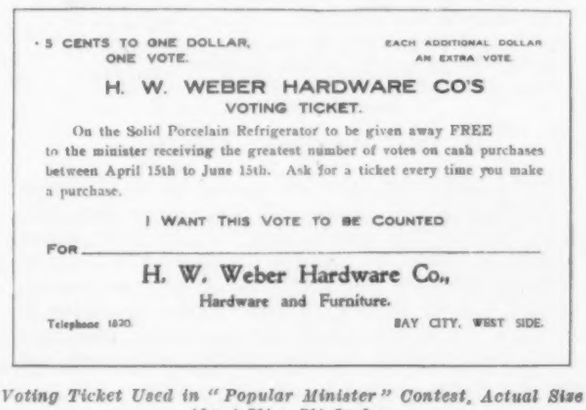
"Window Washing"
Wheeler Self-Fitting Screens make window washing easy.
You merely have to loosen the adjusting thumb screws, lift out the screen, clean the glass on the outside, put the screen again in place, and tighten the adjusting screws.
That's all there is to it.
No strips to slide on—no tools necessary to make tight—just simplicity and convenience in every way.
Low in price, too. You can try them on 10 day's approval.
BARRETT HARDWARE CO.

Window Screen Advertising.

goods from intruders, who in the absence of keys to the premises sometimes seek admission by the windows. At other times a 10-inch double column ad. was inserted. All of the advertisements were of a character pretty sure to arrest the eye of the newspaper reader, the text being brief and to the point. The suggestion of a trial "on ten days' approval" doubtless invited the confidence of the store's patrons.

"POPULAR MINISTER" VOTING COMPETITION.

H. W. WEBER HARDWARE COMPANY, Bay City, Mich., several months since offered a prize to be awarded to the most popular minister in the city as determined by the votes of purchasers at the company's store. The prize was a handsome porcelain Refrigerator. Purchases of 5 cents to $1 entitled buyers to one vote, each additional dollar securing another vote. The voting contest lasted two months, April 15 to June 15, and was


5 CENTS TO ONE DOLLAR, ONE VOTE.
EACH ADDITIONAL DOLLAR AN EXTRA VOTE.
H. W. WEBER HARDWARE CO'S
VOTING TICKET.
On the Solid Porcelain Refrigerator to be given away FREE to the minister receiving the greatest number of votes on cash purchases between April 15th to June 15th. Ask for a ticket every time you make a purchase.
I WANT THIS VOTE TO BE COUNTED
FOR
H. W. Weber Hardware Co.,
Hardware and Furniture.
Telephone 1020.
BAY CITY, WEST SIDE.

Voting Ticket Used in "Popular Minister" Contest, Actual Size About 3½ x 5½ Inches.

limited to cash purchases or collect telephone orders. The company was very much gratified with the results of its

enterprise. The interest of the people identified with the different denominations never flagged, and a good deal of money was spent at the store which might have gone elsewhere but for the contest. The Refrigerator was finally awarded to the pastor of the First Methodist Episcopal Church, which by the way, owns its own parsonage, so that the Refrigerator will be a standing advertisement for the Weber Company for an indefinite time. The company has been so much impressed with the profitableness and

Ent'd JUN 2- 1904
Who Had the First Sail?
-NOAH-
We have a sale every day in the week on Furniture and Hardware.
H. W. WEBER HARDWARE CO.

Newspaper Ad. Posted on Slip for Filing.

trade winning merits of the popular contest scheme that it is thinking of taking up other competitions from time to time.

This firm makes liberal use of the advertising space in the local newspapers. A file is kept of all the ads., specimens of each being clipped from the newspapers and pasted on cards for future reference. An illustration of a pasted ad. is given herewith. This method of preserving the firm's advertising announcements is referred to as useful and suggestive, as some of the ads. can be repeated at intervals to good advantage, while others can be employed with slight modification.

HINTS TO HARDWARE MERCHANTS ABOUT GETTING NEW BUSINESS.

Established trade will take care of itself, but the new customer of to-day is the old one of to-morrow, and so the paths and byways of every Hardwareman's individual territory ought to be gone over frequently for the new customer. He exists, so all that need be done is to find him.

BY H. A. JOHNSON.

II. THE MASONS' TRADE.

IN every community there are mechanics of all trades. These men are human and they appreciate little things; in fact, they attach much thought to the things that men of affairs are prone to overlook. For instance, a letter. How often does a brick or stone mason receive a letter! Rather seldom. A letter means something to him, since he receives so few. Let us suppose, then, that letter is from Hustle & Catchem Hardware Company, and reads like this:

Mr. Patrick Brophy, 16 Gifford avenue, Poughkeepsie, N. Y.

DEAR MR. BROPHY.—It is quite some time since we have seen you in our store, and we are wondering why.

Certainly you haven't forgotten us. This letter shows we haven't forgotten *you*.

And because we haven't seen you in our store of late leads us to believe that you are buying your Tools elsewhere. If that is so, won't you let us know why? Won't you give us the opportunity of making things right if you have a grievance?

Suppose your employer should lay you off at a time when jobs were plenty, when you supposed everything was going right, and when you were doing your work as it should be done. Wouldn't you demand a reason?

You certainly would, and you'd get it, too. That is what we want you to do by us, Mr. Brophy. If we have done anything wrong, we want you to say so right to our faces. But perhaps we haven't done anything; maybe you are staying away because you haven't lost or broken a Tool—or had one stolen—and so haven't needed to come to us.

But, all the same, we want to remind you that you are welcome in our store, and we want you to know it. Masons' Tools don't change much, so we haven't anything new to attract you, but our stock of standard Tools, Trowels, Hammers, Levels, &c., is full and complete and the prices are right. When you need anything in Tools, come to us. Remember, too, we have lots of things for your home. The wife needs "Tools" in her kitchen. Next time she needs anything, tell her we will take good care of her.

Very truly yours,
HUSTLE, CATCHEM HARDWARE COMPANY,
D. G. H.—E. Per D. G. HUSTLE.

Now, let us analyze that letter: "Mr. Brophy" is a hard-working laborer. It's seldom he is "mistered." That then will please him.

The fact that he has been missed, even though he is an infrequent buyer, is a pleasant "jolly."

The expressed willingness to right a wrong, if it is necessary, is one that he would feel to be fair, and if the grievance existed the chances are "Mr." Brophy would come in and ventilate it some Saturday night. If the grievance didn't exist, or "Mr." Brophy had been in recently, he would come around with a pleasantry in commenting on the letter.

"The Wife."

The idea of embodying something in the letter that concerns "the wife" is one that will prove fruitful. It is the workingman's wife who directs all purchases, and if she be loyal to Hustle & Catchem she will tell Patrick to go there and get a Trowel, and Pat will do as he is told. In his household it is customary to turn in his pay to the wife; his sons and daughters do likewise. She doles it out as she thinks best, therefore it behooves any and all merchants to make friends with the workingman's faithful wife. And she will appreciate being remembered in the letter.

"Mr." Brophy isn't educated up to circular letters, and when he receives the above he won't know but what he has been especially written to.

He Will Talk About the Letter

to his fellow workman "on the job." Suppose some others speak up and say they had a similar letter. That won't hurt a bit, for every one then will discuss the Hustle, Catchem & Co.'s progressiveness. If over the dinner pails Hustle, Catchem & Co. are favorably discussed, isn't that good advertising?

The method of using this letter is as follows: Compile a list, to include the name and home address of every mason, plasterer and finisher in your city. Have the letter typewritten, and copied either in mimeograph ways, or printed and addressed on the typewriter, using the firm stationery. They can be sent out with a 1 or a 2 cent stamp, but a 2-cent stamp is best. Counting stationery, stamps, printing and time, a list of 200 wouldn't cost over $8.

ADVERTISEMENT OF CARPENTERS' TOOLS.

THE advertisement reproduced herewith was recently employed by a merchant in New York State to call attention to his line of Tools for carpenters' use. The story which it has to tell is told in a manner apt to be influential with the buying public. The importance of

quality in this line, the willingness of the proprietor to make good in case of defects and the moderation used in

EVERY CARPENTER WHO USES TOOLS

will be interested in our run on carpenters' tools this week. Everything we offer is standard grade and many of our lines have a guarantee behind them which absolutely protects the buyer. Notwithstanding the greatest of care, flaws that cannot be detected in the surface will show up in tools. In cases like that we are always glad to know of it and to make it right with the customer. Almost every tool in our establishment has been re-marked, old profit-basis has been entirely discarded, and department store rules have been substituted. This store is now the best tool headquarters in the city (as it always has been) and it is now the cheapest as well. We ask every tool user in town to prove what we say.

pricing the goods are briefly and invitingly set forth. Good business followed in the wake of this piece of "copy" we are advised.

NEW CASTLE FORGE & BOLT COMPANY.

THE New Castle Forge & Bolt Company, New Castle, Pa., whose forge department was recently destroyed by fire, will rebuild the burned portion of its plant as fast as possible and on a larger scale than before. The company anticipates little or no difficulty in filling orders promptly for its products and is in good position to take care of its customers.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM E. L. FOLK & Co., Woodstock, Va., jobbers of Hardware and Mill Supplies, whose main house is at Suffolk, Va.

FROM THE TOOL COMPANY, Atlanta, Ga., A. E. Hill, president; C. M. Reynolds, treasurer, and L. S. Holley, secretary, which has been incorporated with an authorized capital of $25,000 to conduct a wholesale and retail business in Tools and Cutlery, being one of a very few houses in the country handling these lines exclusively. The store is an especially attractive one and has been fitted up with Warren shelving.

FROM J. J. HOUSTON, Guthrie, Okla., who has bought the Hardware, Stove, Paint and Sporting Goods business of the Gibson Hardware Company, formerly the Spencer Hardware Company.

TRADE ITEMS.

HUGO OLSEN, son of Peter B. Olsen, clerk of Cook County, Chicago, who has been in the Hardware business in South Africa for nine years, says that South Africa offers great inducements to American manufacturers. American Stoves, he says, are rapidly becoming popular and American Edge Tools are in great demand owing to their superior quality, while American Mining Machines have almost a monopoly on the "Rand." Mr. Olsen left Chicago for the Transvaal in 1896 at the age of 21 and secured employment in Johannesburg in the Hardware store of W. Boustred & Co., later going with J. Forrest & Co., General Hardware merchants, of Johannesburg and Durban, and from 1901 to 1904 was manager of their wholesale department. He is now returning to South Africa from a recent visit to Chicago, and will on his arrival there assume his old position. S. B. Pray & Co. of Boston and New York are the American representatives of Forrest & Co.

LIVINGSTON NAIL COMPANY, 104 Reade street, New York, announces under date of August 21 that its contract with the Cambria Steel Company for Gautier Toe Calks having expired by limitation the Livingston Company will hereafter fill its Toe Calk orders with Juniata brand Calks, which are made in all the various patterns, and at the same prices and terms as was formerly the case with the Gautier. The company intimates that Juniata Calks can be shipped from mill in car with Juniata Horseshoes.

THE TURNER & SEYMOUR MFG. COMPANY, Torrington, Conn., has purchased the Upholstery Nail business, including Upholstery Nails, Plain and Fancy; Numeral Nails, Thumb Tacks, Drugget Pins, Carpet Nails and Screws, &c., formerly owned and operated by the Torrington Mfg. Company. The Turner & Seymour Company intends to improve the quality and packing of the goods and to put out articles first class in every particular. The machines are now in operation, and the company will be pleased to receive inquiries from the trade in regard to this line.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION.

THE committee appointed by the Southern Hardware Jobbers' Association to select the time for the next annual convention has chosen June 12, 13, 14 and 15, 1906. As was determined at the last convention, Hot Springs, Va., will again be the scene of the annual gathering.

WISCONSIN RETAIL HARDWARE ASSOCIATION.

THE tenth annual meeting of the Wisconsin Retail Hardware Association will be held in Milwaukee February 7 and 8 next. The association has grown so materially that larger quarters have to be provided for the next convention. The West Side Turn Hall has accordingly been rented for the occasion, spaces in which can be secured by intending exhibitors by communicating with the Exhibit Committee, Henry Daniels, Jr., secretary, 276 West Water street, Milwaukee.

AT some period in the life of every business there comes a time when things do not run along smoothly and when some temporary difficulty may threaten its very existence. It is at such a time that a good business reputation is of especial value, for it is then that it may be necessary to ask favors. The good business man always remembers that business is business. He does not extend favors or accommodations for the sake of personal friendship, but if a house possesses a good business reputation he will give it all the assistance that the facts and good business judgment warrant.

NEW ORLEANS NOTES.

FROM A SPECIAL CORRESPONDENT.

THE business year, that in New Orleans, according to old custom, ends September 1, has been a twelvemonth of great beginnings whereof the profitable end is still sure, although somewhat deferred by unfortunate circumstances beyond the surmise of the business community of the city. The year closes with a distinctly widened horizon for future activity and with a total of business done to date that surpasses that of the same period of the previous year, and this despite the slump in cotton early last winter, despite the outbreak of yellow fever last July, despite the quarantine panic that has seized hold of the communities through rural Louisiana, through Texas, through Mississippi and portions of Alabama, and despite the methods that business opponents have adopted to take undue advantage of the circumstance of yellow fever in New Orleans.

Factors That Maintained High Level.

When the tremendous autumn trade of 1904 was checked and curbed and partially crippled by the shock of the historic cotton report of December, which cut off one-third of the purchasing power of the cotton planters, the operation served as a pruning often does to a plant. The cotton district market was partially shut off, and the Hardware merchants set about widening their fields elsewhere and putting themselves in a position that could not be seriously affected by the injury to any one or two tributary interests. This last tendency is said by the Hardwaremen who look to the philosophic facts of their business to be the most striking and the most characteristic phase of the business year just now ending—the effort of the New Orleans Hardware world to emancipate itself from dependence on the prosperity of the cotton and sugar planters of the lower middle South.

With Panama and Central America crying for attention and giving a large trade through longer and more difficult routes to New York and the East, simply because the New Orleans merchants have neglected opportunities and have failed or deliberately refused to co-operate to any one definite end to intercept that trade, some New Orleans merchants have endeavored and have succeeded to a great extent in capturing a *clientele* well worth while in the Spanish Americas. The persistent efforts of the New Orleans Board of Trade, working through the special Panama Committee, and previously through the efforts of the special delegation that visited Panama, did much toward facilitating the work of New Orleans seekers after this business. In the work thus accomplished was the enlargement of the scope of the Panama Canal Purchasing Agency here, the guarantee that the bill of lading facilities over the Panama Railroad should be the same to all ports and the general advertisement of the city to the government and to the people of Central America.

Hampering and hindering the work of this committee has been a continual element of jealousy and bickering in the Hardware world of New Orleans as to the ways and means whereby the ends common to all might be attained. All save a few in the local market agree that a compromise on measures, backed by united support, would have accomplished much more for the city than was done. Owing to the increased trade, much of it Hardware and kindred goods, transportation facilities greatly increased to Central America. This in turn exercised a reciprocal effect of quickening the further development of trade.

Cuban Movement.

Into Cuba trade was facilitated and developed by the establishment of the Munson Line to the ports along the northern and southern Cuban coast beyond the scope of Havana. This served to add a jobbing territory to the New Orleans wholesale merchants that had hitherto been completely out of reach. New York had always been able to reach these same ports direct via steamship at freight rate charges, which cut far under the rates possible to New Orleans merchants, who had to depend on steamship into Havana and then transference to the railroads running out of the Cuban capital to the ports and sections in question. The inauguration of the Munson Line service into Matanzas, Cienfuegos and other points proved successful from the beginning, and New Orleans trade at once began flowing into the great sugar districts in the east central section of the island.

Here a considerable market existed wherein many Orleanians already had interests. They naturally turned to this port for supplies when other conditions were equal. Heavy shipments of Machinery, Machinery Supplies, Mill Supplies, &c., were made during the early summer, and have even continued through the fever infection, despite the fact that the trade now has to go via Mobile and thence through the Munson liners. Coastwise trade to Florida and to the west Texas coast line has grown to considerable proportions, where formerly it was simply nonexistent. Two steamships now ply to west and southern Florida, or, rather, plied until quarantine regulations interposed, where before only a few scattering schooner loads of goods went several times a year. This Florida development has added a jobbing and wholesale territory formerly the exclusive property of Georgia and Carolina cities and of New York.

Domestic Developments.

Within the United States, where, of course, the bulk of business is maintained, there has been a satisfactory adjustment of transportation routes and rates during the year, inuring to the benefit of this city. While the cotton planters were stopped in their course of expenditure last December and remained meager buyers until late in March, they purchased heavily during March and even into early April. Since that time they have been careful and consistent in their purchases, and the urban communities dependent on the cotton districts have not stinted themselves to any appreciable degree.

Until late in the spring the sugar planters were the most liberal purchasers of the entire range of the Hardware market, buying Implements, Building Hardware, Mill Supplies and general Hardware with a liberal hand. Since that period the decline in the price of sugar has brought about an enforced curtailment of the purchases.

Into the saw mill country and the growing towns of the truck garden district of the several nearby States heavy shipments of Building and Builders' Hardware have gone out, with considerable shipments of general Hardware. The rice country has been a meager purchaser except where saved from the necessities of the situation by other interests, such as Oil, &c.

A striking feature of the business has been the preparation for a growing Ship Chandlery business and Ship Hardware of all sorts and kinds—this especially in view of the shipbuilding and docking arrangements made by the New Orleans Dry Dock & Shipbuilding Company, including the Woodward-Wight and Hero interests.

Taking the lines as they have run, Building and Builders' Hardware have led everything, with Mill Supplies relatively next. Plantation and Machinery Hardware have aided in this development.

In the domestic trade Interior House Fittings and House Supplies have been a tremendous item. Implements have run well, despite the heavily foreshortened hopes of the cotton planters last year and the bad crop outlook, barely compensated for by the prospective high prices this season.

Neither slumps in cotton nor yellow fever infection has served to curtail the retail Hardware business in New Orleans during the past year. Continually increasing population, a boom in building activities and the shifting and changing of the renting population owing to improved financial conditions have combined to maintain an active demand in many separate lines at once. Builders' Hardware and Builders' Supplies have easily followed what is always the leading city line, Household Hardware.

A. Baldwin & Co. have thrown the entire ground floor of their main building in Camp street over to the retail department, placing the wholesale department, offices and sample rooms on the second and the half story. The warehousing and delivery departments on the ground floor open into Common street, as heretofore.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

G. & D. MFG. COMPANY, Streator, Ill.: Booklet referring to the Farmer's Friend Portable Grain Elevator and Wagon Dump.

MERIDEN BRITANNIA COMPANY, Meriden, Conn., International Silver Company, successor: Unique circular in the form of a newspaper purporting to be issued in 1847 and containing news items of that day, together with illustrations and advertisements of 1847 Rogers Bros. Silver Plate.

WOODMANSE MFG. COMPANY, Freeport, Ill.: Catalogue of Woodmanse Wind Mills and parts; also catalogue illustrating and describing in detail Woodmanse Automatic Air Pressure Water Works.

J. L. MORRIS STOVE REPAIR COMPANY, Chicago, Ill.: Catalogue of Stove and Furnace parts, Laundry Stoves, Registers, Cast Iron Door Sills and Stair Plates, Alley Covers and other cast specialties.

WILCOX MFG. COMPANY, Aurora, Ill.: Catalogue No. 6, referring to House Door Hangers, Barn Door Hangers and Accessories, Cranes, Hoists and Carriers, Rolling Store Ladders, Fire Door Equipment, Mounted Grindstones and Emery Wheels and Hardware Specialties.

C. W. PARKER COMPANY, Rockford, Ill.: Folder referring to Hastings' Free Running Reels.

BUILDERS' SUPPLY COMPANY, Indianapolis, Ind.: Catalogue of Duplex and Simplex Door Bells.

FLINT & WALLING MFG. COMPANY Kendallville, Ind.: Handsomely illustrated catalogue No. 46, referring to Star Wind Mills, Towers, Tanks, Pumps and Sundries.

PORTLAND LADDER COMPANY, Portland, Ore.: Mailing card referring to Fire, Farm, Trestle, Extension and Painters' Ladders.

SCRANTON WHETSTONE & ABRASIVE WHEEL COMPANY, Scranton, Pa.: Catalogue of Whetstones, Oil and Water Stones and Scythe Stones; also Corundum and Emery Wheels, with booklet entitled "Wheels and How to Use Them."

HUNT, HELM, FERRIS & Co., Harvard, Ill.: Catalogue illustrated in colors referring to Star Steel Sleds; also catalogue of Star Coaster Wagons and Runners for same.

DAYTON MALLEABLE IRON COMPANY, Dayton, Ohio: Supplement to tenth edition of catalogue, referring to Carriage Hardware and containing revised lists on Rubber Covered Steps and Roller Wear Irons.

R. E. CHAPIN MFG. WORKS, Batavia, N. Y.: Catalogue of Galvanized Oil Cans, Tanks, Pumps, Wagon and Shipping Cans, Varnish Cans and Sheet Metal Specialties.

PITTSBURGH TOOL & DROP FORGE COMPANY, Cheswick, Pa.: Catalogue and price-list of Railroad, Track, Contractors' and Miners' Tools.

LAMSON & SESSIONS COMPANY, Cleveland, Ohio: Catalogue price-list of Bolts, Nuts, Rivets, Wrenches, &c.

CRESCENT HANDLE WORKS, Evansville, Ind.: Catalogue A illustrating and listing complete line of Agricultural Tool Handles, Logging Tools and Elm Hub Blocks, with description of XX, X and No. 1 grades, methods of packing and tables of approximate weights.

STREATOR METAL STAMPING COMPANY, Streator, Ill.: Catalogue of Sterling Steel Carpet Sweepers, illustrating different models and giving details of construction.

I. DURLACH, 54 Vesey Street, New York: Price-list of plain and galvanized sheet metal specialties, patent indestructible Ash and Garbage Cans, Oily Waste Cans, Steel Pails, &c.

HEMP & Co., Second street and Chouteau avenue, St. Louis, Mo.: Illustrated catalogue devoted to Patent Cook Stove, Pipe, Elbows, Air Tight Heaters, Ash Scoops, Roof Flanges, Ventilating Rings and Ventilators, Well Buckets, Camp Stoves, Oil and Gasoline Cans, Oil Pumps, &c.

JOHN CHATILLON & SONS' CATALOGUE.

JOHN CHATILLON & SONS, 85-93 Cliff street, New York, have just issued a very attractive bound catalogue comprising 280 pages, covering their well-known line of Spring Balances, Scales, Butchers' Cutlery, &c. It marks the seventieth anniversary of the establishment of their business in 1835. An insert in the early pages of the catalogue gives a *fac-simile* of one of their new style dials showing 50 pounds, a Scale with 150 pounds capacity, weighing the maximum with three revolutions of the pointer. The dial is marked every ½ pound, figured in black every pound, every 5 pounds being figured in red, making the reading of the dial a very simple matter. The manufacturers call special attention to the completeness of information afforded by the catalogue in regard to their products. The catalogue represents a large number of additions to their line as well as modifications in former patterns. Among the additions are new Butcher Scales, with extra large dials and patented device for preventing the vibration of the pointer, making it stop instantly at the correct weight; Spring Platform Scales for counter use; Laundry Scales, with platform 24 x 24 inches on bottom and 24 x 27 inches on top, turned up 6 inches at each end, that nearest column being perpendicular; Automatic Weighing Machine, especially designed for weighing quickly and accurately packages for express or mail in bulk, and Automatic Weighing Machine for weighing freight at railroad stations, in warehouses or for use by merchants when receiving or shipping freight. Following the presentation of the Chatillon Spring Balances and Scales about 40 pages are devoted to Knives, Cleavers, Steels and other Butchers' Tools of Foster Brothers & Chatillon Company, for whom John Chatillon & Sons are sole selling agents. There are a number of new patterns in Carvers, Slicers and Butcher Knives, and the company makes a specialty of Knives for the use of hotel *chefs*. In Butcher Steels a very much larger line is presented than ever before. A small edition, pocket size, which is an exact reproduction of the contents of the bound catalogue, is also issued.

AMERICAN TOOL COMPANY.

A NEW plant for the production of Axes and later on of Hatchets, Adzes, &c., is being completed at Highland Park, a suburb of Louisville, Ky. The factory is located in the center of a 10-acre tract acquired by the company, the buildings being so arranged that the plant can be enlarged without destroying logical sequence of departments or interrupting work. In the manufacture of Axes the company makes the polls of soft steel, to which crucible steel blades are welded. Forging and tempering are done by means of heat from artificial gas. The plant will have a capacity of 300 dozen Axes per eight-hour turn, skilled workmen of long experience being employed. Following are the officers of the company: President, J. Adger Stewart, connected with the Ohio Falls Car Company, at Jeffersonville, Ind., until the sale of that business to the American Car & Foundry Company, and later proprietor of the Louisville Forge Company, manufacturer of Car Axles, &c.; vice-president and general manager, Wm. Kelly Thompson, a nephew of Mr. Kelly of the Kelly Axe Mfg. Company, with which firm he had been employed for the last 12 years; secretary and treasurer, James D. Augustus, for a number of years secretary and superintendent of the Louisville Forge Company.

O. J. Ziegler has disposed of his entire interest in the Stover Mfg. Company, Freeport, Ill., to D. C. Stover. Mr. Stover has now bought out the interests of all of his original partners in the company. Mr. Ziegler had been identified with the company since its incorporation nearly 25 years ago. The business of the company so far this year has exceeded that of any previous year.

Correspondence.

IS IT THE CATALOGUE HOUSE WHICH IS WORKING HARDSHIP ON THE RETAILER?

To the Editor: At the recent meeting of the Oklahoma and Indian Territory Hardware and Implement Dealers' Association quite a good deal was said by the representative of one of our leading jobbing houses about that bogie man, the catalogue house. Were it not my duty as a representative of about 400 of the largest retail dealers in the country to call attention to his remarkable utterances I would not dare do so, as he is a great and honorable man, and might become highly offended and even indignant. I will take a chance, however, and give an insight without prejudice into the real cause of the hardship.

After traveling many thousand miles and making diligent inquiries into the conditions of the business of our friend, the retailer, I find that the business of catalogue houses is comparatively small in each particular section of the country over which I have traveled, and is not felt to any great extent by the retailer. Of course, their business collectively is enormous and has the appearance of being a very great drawback to the retail trade.

But as records show that only a small percentage of the product of Hardware manufacturers is marketed through the catalogue house, then the catalogue house must only be held responsible for a small percentage of the injury which is being done to the retailer. It is therefore easy for us to come to the conclusion that most of the injury which is being done to the retailer must necessarily come from the jobber. While he is a great and honorable man he does not fail to instruct his salesman to sell all who will buy of him, and oftentimes advises him to save his good things to influence new trade.

I have in my possession memoranda taken from several hundred towns wherein the jobber has placed his goods in the hands of illegitimate dealers. If the retail dealer will take the time and trouble to investigate he will find, in many instances, Pocket Cutlery and Shears and Razors in the stores of druggists and in saddlery shops. He will find Baseball Goods, Fishing Tackle and Pocket Cutlery in book stores and peanut stands. He will find Guns and Gun Goods in pawn shops, and House Furnishing Goods in the racket stores and grocery stores. These goods were not placed there by the catalogue house but by the very jobbers who are to-day making a great cry about the catalogue house in order to divert the attention of the retail dealer from the real cause of their trouble.

The real remedy is to buy your goods from the factory, thereby saving for yourself the jobber's profit and at the same time placing yourself in position to meet the price of those illegitimate dealers created by the jobber.

J. B. WOODY.

AMERICAN FORK & HOE COMPANY.

THE AMERICAN FORK & HOE COMPANY is establishing a large and model plant at Memphis, Tenn. The company has purchased a tract of 15 acres of land with substantial mill construction brick buildings completely equipped and with steam heating and fire sprinkling system, and exceeding 75 x 1200 feet of floor space. This property has not only large track facilities for carload business, but is in the immediate proximity of the railroad freight houses. The plant (one of 13 of the American Fork & Hoe Company) is laid out on a splendid scale. A full and complete line of light, heavy and special Steel Goods as well as Wood Goods, will be made and carried in stock, ready for delivery to the trade the coming season. These works will be in the immediate charge of men of large experience in both the manufacture and selling of Steel and Wood Goods, and the trade may feel fully assured of being promptly supplied with high grade goods.

Burgert & Banister, Galion, Ohio, have sold their Hardware business to the Diamond Hardware Company, which will continue it under the management of Hugh Diamond.

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BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK STREET, LONDON, W. C.

State of the Hardware Trade.

The sporting season began on August 12 and Gun makers are not doing so badly as in former years. Some of the old established firms whose Guns have a reputation find orders coming in more freely, and this indicates that there is not such a tightness of money as was the case a year ago. It is probable that the demand for cheap Guns is rather worse than in former years. This depression in cheaper Guns, rightly or wrongly, is ascribed to American competition. It is undoubtedly the fact that American Gun manufacturers are making big inroads on the British trade. There is a large demand for Wagon accessories, the Wagon manufacturing firms working under considerable pressure, chiefly on foreign account. Indeed, there is some difficulty in coping with the demand for this class of article. The Cycle trade maintains its activity, but from now on pressure will probably be less.

The Hardware trade in its more limited sense is not satisfactory, the demand for Tin Plate and Enameled Goods being much less than last year. This weakness is particularly noticeable in the home trade. Steel Toy makers are not doing much. More animation is observable in the Iron Hurdle and Fencing departments, and Enameled Sign Plates for advertising are being produced in large quantities. Builders' Ironmongery shows some improvement and shipping tackle is being bought freely in the northern ports. Pumping machinery for irrigation and mining purposes is selling well, especially on foreign account.

Foreign business may be described as so so. The trade with Australia and New Zealand is well maintained, but South African orders lag sadly. India is buying up to average, but the Eastern trade generally is quiet, doubtless due to the war. South America is still a good buyer, and I cannot understand how it is that more determined efforts are not made to capture this market by American exporters.

The Hardware Exhibition.

It seems to be a fact that all attempts to organize small expositions in the Hardware and allied trades either fail to succeed or make a very poor success. Thus the Hardware Exhibition, which was held at the Agricultural Hall, London, a week or two ago, passed off without much notice, and although I know nothing of the financial results, yet the general appearance was sleepy and I do not think much trade was done. A number of American firms had exhibits, such as the South British Trading Company and John G. Rollins & Sons, while a variety of American goods was observable on stands owned by British trading concerns. On the whole it seems to me that Hardware exhibitions are not fruitful and I have some doubt as to whether much will be done in this direction in the future. The trade is so complex, there are so many thousand different articles, all of which go to make up the stock of a Hardwareman; novelties are so numerous, coming out practically week by week, that a day or two spent at an exhibition of Hardware is of small service to the visitor. All this emphasizes the constant necessity of exporters and manufacturers getting into close touch with the retailer in his own shop, either directly or indirectly through capable and efficient agents.

The Antwerp Ivory Sales.

The quarterly Antwerp ivory auction was held last Tuesday and Wednesday. Eighty-two tons were put upon the catalogue, but nearly 14 tons were withdrawn prior to the sale. The American demand was not so strong as recently, consequently there has been a considerable drop in the prices compared with the May sales. Large and medium teeth sold £3 and £4 under the last Antwerp sale. Bangle teeth, £1 lower; scrivelloes firm. Ball scrivelloes, soft descriptions, maintained the recent high prices paid in the London sales, the equivalent to £140 per hundredweight being paid. Soft teeth of all kinds sold £3 cheaper than the recent London sales. Germany bought largely, France and America moderately. Sheffield commenced to buy a little at the commencement, but when they found the market dropping away still further they almost retired.

International Competition in Australia.

Judging by the last Blue Book issued, it is evident that Great Britain still holds the largest share of the trade of the Australian Commonwealth, but other countries are doing a large business, and it seems probable that the Commonwealth will not lightly cut the business connections which have been established, particularly with the United States and Germany, even for the sake of a preferential tariff. In such articles as Gas and Oil Engines, Boilers and Pumps, Machine Tools, Axles and Springs, Sheet and Pipe Lead, Cycles, Paints and Colors, Great Britain has an overwhelming proportion of all these different lines. In Nails, Spikes and Tacks the British percentage is 44, the German and Belgian 34 and American 21. In Horse Nails Great Britain supplies 27 per cent., America 10 per cent. and Germany and Belgium 41 per cent. This seems to be the strong line so far as Germany and Belgium are concerned. The proportions of Wire are closer, Britain supplying 33, America 30, Germany and Belgium 36 per cent. In Rifles and Shotguns is where America comes in strongly, with 40 per cent., compared with 34 per cent. British and 26 per cent. Belgian. Again, in Revolvers and Pistols the American percentage is 51 per cent., compared with 23 per cent. British and 25 per cent. German. In Lamps and Lampware the British percentage is 41, American 30, German and Belgian 27 per cent. Reverting to Horse Nails, it may be pointed out that Sweden probably supplies a very considerable percentage both of that sent by Great Britain and by Germany. During 1903 Australia exported £10,000,000 worth more than she imported, a point upon which there has been endless discussion.

SAM'L HALL'S SONS BOLT WORKS.

THE extensive works of Sam'l Hall's Sons on West Tenth street, in the heart of New York City, occupy a site which would hardly be selected for such a plant at the present day and under the present values of real estate. The fact is, however, that the little forge from which this business grew was set up but a few hundred yards from the present location when the district was in the very outskirts of the city. Samuel Hall came over from England and in 1839 made his first start, stamping out Washers with a hand press. From the sale of his Washers he realized enough to buy a forge and anvil and went to making Bolts, which he sold as fast as he turned them out. Although Mr. Hall never had a partner, he took his son Charles into the business as soon as he was able to count off a hundred Washers on a string and tie them up ready for sale. Some years later an English Bolt making machine was purchased and in the '60's the Halls secured one of the Lewis power machines, which were among the first invented. Such a machine is still being operated in the works at the present day. The makers, Lewis, Oliver & Phillips, were the predecessors of the Oliver Iron & Steel Company of Pittsburgh.

In 1858 the Hall firm patented a device for making Hot Pressed Nuts. It has been erroneously stated that this patent was successfully contested by Russell, Burdsall & Ward of Port Chester, N. Y., but such is not the case. The patent was never contested and the relations between these two firms have always been of the most friendly nature. Charles Hall, who, as we have seen, entered the business at such an early age, proved to be of an inventive turn of mind and devised and built a number of very successful machines, especially for making Bolts and Tapping Nuts. These machines were never offered for sale, but were used only for increasing and improving the product of the Hall works. Although many years old, several of them are still in use and pushing the latest and most improved machines very hard for speed, efficiency and uniformity of output. In fact, it is in uniformity and accuracy of gauge that excellence is claimed for the Hall Bolts and it is stated that no

expense is spared in labor, waste stock or tools to attain the desired results. Nuts are invariably turned on by hand, so that if they bind the fact is immediately detected and they are thrown out.

Charles Hall has now retired, but his son, Charles E. Hall, is in charge of the business. He is a thoroughly practical man, having had years of experience in the works, machine shop and drafting room. Although the character of their Bolts is such that they are mainly used where the highest quality is imperative without regard to cost, nevertheless their equipment is steadily being increased to meet the requirements of the business. In a recent publication devoted to the Bolt making industry a mistake was made in stating that Samuel Hall was originally a Chain maker, it is possible that he was confused with Isaac Hall, founder of the Chain and Anchor business on lower Broad street, New York, now styled Wm. A. Hall's Son.

OLIVER BROTHERS PURCHASING COMPANY.

IN connection with the announcement of the incorporation of the Oliver Brothers Purchasing Campany, which appeared in *The Iron Age* of August 17, the dates given were manifestly incorrect and should have been ten years earlier, as follows: The business was started by Thomas E. Oliver on January 1, 1891, with whom James H. Oliver was associated as clerk. On May 1, 1892, Frank J. Oliver became connected with the business, when the name was changed to Oliver Brothers.

INLAND EMPIRE IMPLEMENT AND HARDWARE DEALERS' ASSOCIATION.

WE give herewith portraits of the officers and a few of the directors of the Inland Empire Implement and Hardware Dealers' Association, which was organized in Spokane, Wash., in February last and which held its semiannual or summer meeting in the same city in June. At the latter meeting it was determined to affiliate with the National Retail Hardware Association.

C. L. BUTTERFIELD,
Moscow, Idaho, President.

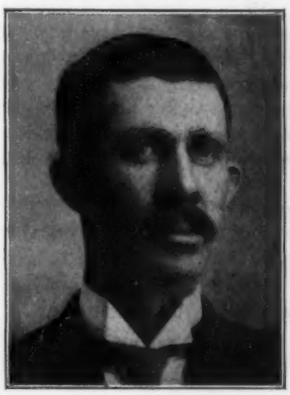
The Inland Empire Association has been organized on the same general lines as the numerous State Hardware associations and is designed to cover all the merchants in Hardware and Implements in the territory known in local parlance as the "Inland Empire," which embraces the country between the Snake River on the south, British Columbia on the north, the Cascade Mountains on the west and the Rockies on the east. As noted in the constitution and by-laws, "any one handling a stock of Hardware or Implements commensurate with the needs of his community is denominated a legitimate dealer in Hardware and Implements," and as such is eligible for membership in the association. Probably 175 firms are now embraced in the membership of the association, including many of the largest and best known houses in its territory.

E. E. LUCAS,
Davenport, Wash, First Vice-President.

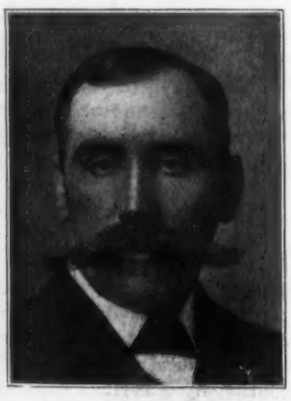
DANA CHILD,
Spokane, Wash., Second Vice-President.

E. W. EVENSON,
Spokane, Wash., Secretary.

J. A. FRIDAKER,
Spokane, Wash., Treasurer.



A. L. MALTBIE,
Waterville, Wash., Director.



R. L. SPIKER,
Nez Perce, Idaho, Director.

F. T. LARRABEE,
Edwall, Wash., Director.

E. M. HEIFNER,
Colville, Wash., Director.

THE BUILDERS' SUPPLY COMPANY Indianapolis, Ind., has lately doubled the capacity of its plant for the manufacture of Duplex and Simplex Door Bells, yet it is still experiencing some difficulty in executing its increasing orders. The company is now making Bell Plates or Escutcheons to match the popular Lock Sets of the day, and claims that it can supply Push Button Bells to the jobbing trade at a considerable saving on the cost of other goods of the same grade.

AMONG THE HARDWARE TRADE.

Geo. W. Hoggman, Kendallville, Ind., has bought the stock of Hardware, Stoves, Implements, Buggies, &c., of Cawley & Cawley and will continue business at the old stand.

The Hardware, Cutlery, Paint and Farming Tool business in Pittsfield, N. H., owned by the Estate of Ellery B. Ring and conducted by it since Mr. Ring's death, five years ago, has been sold to Nutter & Foss, who have moved into a new store and will carry these lines in addition to Stoves and Plumbing.

The Shannon Hardware Company has purchased the stock and leased the building of the Smith Hardware Company, West Blocton, Ala., and will continue the business.

The Smith Hardware Company, formerly of West Blocton, Ala., has leased a store in Ensley, Ala., which will be occupied on Oct. 1 with a full line of Shelf Hardware, Stoves, Tinware, Sporting Goods, &c.

C. B. Wineburne & Co., Coal Hill, Ark., have been succeeded by the Wineburne-Hunt Hardware Company.

W. M. Smelser, Rockville, Neb., dealer in Hardware, Paints, Harness, &c., has sold a half interest in his business to August Sundstrom, and it will be continued under the style of Smelser & Sundstrom.

The New Murdock Hydrant.

The new Murdock hydrant and street washer made by the Humphryes Mfg. Company, Mansfield, Ohio, is

Fig. 1.—The New Murdock Hydrant.

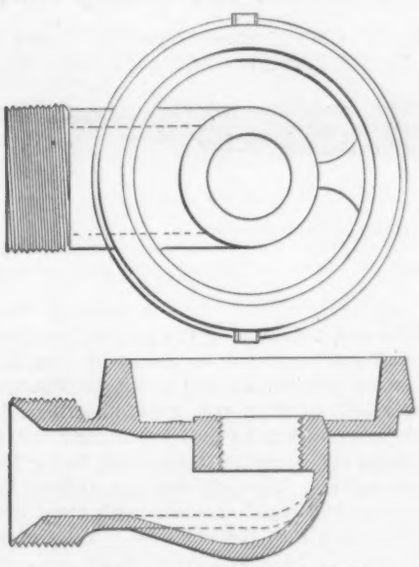


Fig. 2.—Plan and Section of the Bottom Connection.

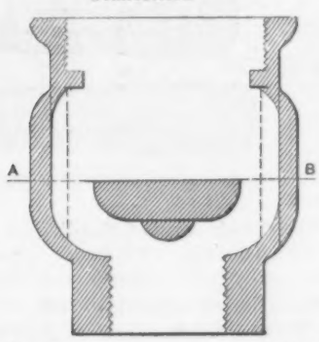


Fig. 3.—The New Form of the Outlet Valve.

shown in Fig. 1. It departs from the construction of the original Murdock hydrant in the two most important parts, which are the valve and the bottom connection. The water surface of the bottom connection, or inlet, has been increased a little over 25 per cent. by building it as shown in Fig. 2. The dotted lines show the connection of the original hydrant, which it will be seen had a much more limited space between the valve seat and the walls of the valve. The enlarged water surface naturally gives a stronger pressure to the valve in the outlet of the hydrant, which was impossible in the original valve. To adapt this valve in the outlet to the increased flow and pressure it is now built as shown in Fig. 3, being enlarged as indicated by the dotted lines and its water surface increased in the same ratio as that of the bottom connection. Without this change in the outlet valve the discharge from the spout would be irregular and eccentric. By the new pattern not only a stronger but also a steadier flow is assured than in the original hydrant, with the added advantage of a much higher pressure than that obtained previously. While making these changes in the valve and bottom connection the company has preserved the drip and waste arrangement of the original design, which is so constructed that the proper amount of water wastes at the proper time. It is believed that the drip waste arrangement could not be improved upon by any change in its construction.

Brock Chain Wrench.

To overcome the tendency of chain wrenches to bend back of the head when subjected to hard usage the Brock Wrench Mfg. Company, 38 Cortlandt street, New York, has reinforced the head of its wrench, while a narrow jaw on the wrench adapts it for use on pipe fittings, valves, bolts, nuts, &c.

The Philadelphia Radial Lamp Holder.

Illustrated herewith is the Philadelphia radial lamp holder, a new device being placed on the market by the Zephyr Ventilator Mfg. Company, Philadelphia, Pa. This is designed to hold an incandescent lamp and is easily and quickly adjusted to any position, either temporary or stationary, which is maintained without vibration or danger of the lamp becoming loose or falling into any part of the machinery. The holder is constructed of a series of links joined together by a special process, easily adjustable, absolutely preventing wear and at all times maintaining enough friction to hold the arm in any desired position. The arm is 30 inches long when extended, is adjustable vertically on a post which is 18 inches

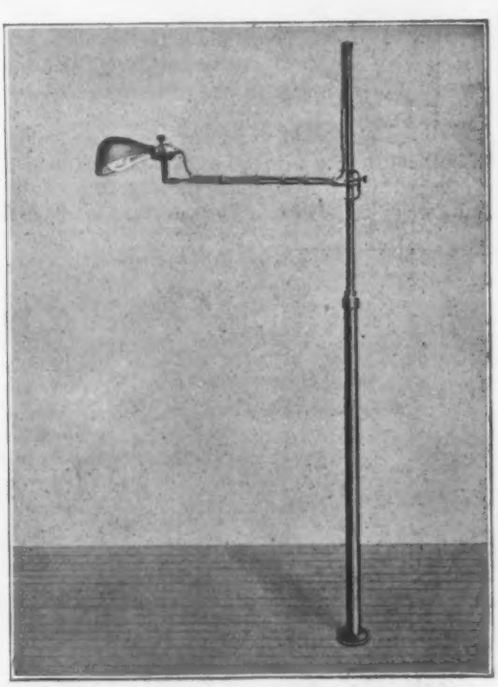


Fig. 1.—The Philadelphia Radial Lamp Holder.

high, for which a number of various bases are furnished, as shown in Fig. 2, so that the post may be attached either to a flat surface or with clamp for portable work which can be used either in a horizontal or vertical position, or a standard base with attachment for adjustment to any T slot is also supplied. The lamp clamp at

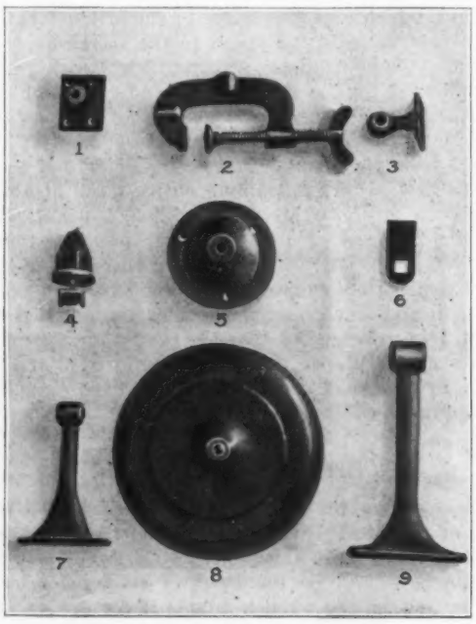


Fig. 2.—Bases for Radial Lamp Holder.

the end of the arm swivels in every direction, so that by use of a shade which rotates completely around the lamp socket the light may be easily directed and concentrated at any desired point. The holder may also be used in connection with a desk or for any other purpose. Hollow standards are furnished to permit of wiring from below, while sockets on the arm at each joint are arranged to carry the wire and permit of turning in any direction without wear or strain. The device is particularly

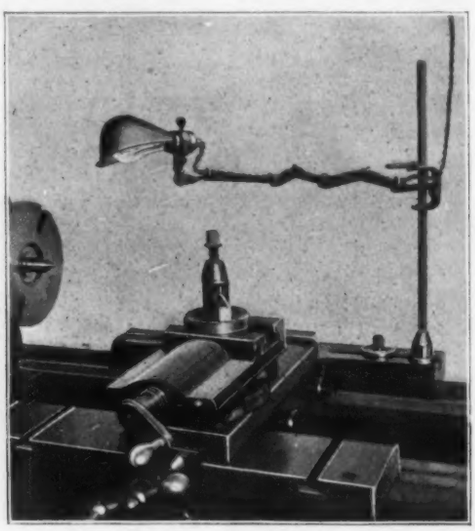
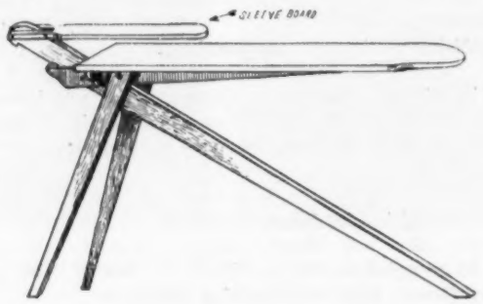


Fig. 3.—Holder Attached to Machine Tool.

adapted for use on lathes, planers, drills, shapers, boring mills or any other machine tools as well as benches, desks, drawing boards, &c., and is furnished in a variety of finishes, as black or polished iron, brass, nickel, oxidized, bronze or copper.

The Ideal Folding Ironing Table.

A. E. Langworthy, Atchison, Kan., has recently patented and put on the market a new ironing table, as shown herewith. This comprises a well finished board 14 x 52 inches and reinforced to prevent warping, supported by three legs at one end, which, when the table is not in use, may be folded against the board into a very small space. Attached to an extension of one



The Ideal Folding Ironing Table.

leg is a sleeve board, which when in position is firm and solid, but can readily be swung back out of the way. The large surface of the main board is a great advantage in ironing bed or table linen, while the fact that the support is all at one end makes it possible for a skirt or other garment to be slipped on, completely ironed and removed without any mussing or inconvenience. The table sells at a moderate price and is said to be very strong and durable.

Winchester Self Loading Rifle, Model 1905.

The Winchester Repeating Arms Company, New Haven, Conn., is offering the new rifle shown in the accompanying cut. It is made in .32 and .35 caliber, the cartridges being the modern smokeless powder type, and are furnished, as shown in Fig. 2, with either full metal patched or soft point bullets, and are desirable for both hunting and target shooting. In using the rifle it is necessary to pull the trigger for each shot, which keeps its operation completely under the control of the operator. The self loading system is referred to as permitting rapid shooting with great accuracy, and it is explained that the ease and novelty of its operation add much to the pleasure of shooting at either target or game. The rifle is made with blued trimmings and a plain walnut stock and forearm, not checked. The barrel is round, 22 inches long and fitted with sporting front and rear sights. Other styles or lengths of barrels cannot be furnished with this rifle. The stock is 14 inches long and finished with a rubber butt plate. The drop at comb is 1⅝ inches, drop at heel 2¼ inches, and length of rifle over all 40 inches. Fancy walnut stocks and forearms, plain or fancy walnut pistol grip stocks, checked or unchecked, and stocks having special length or drop will be furnished for this rifle when so ordered.

Fig. 1.—Winchester Self Loading Rifle, Model 1905.

Fig. 2.—Cartridges Used in Self Loading Rifle.

Queen Ball Bearing and Leader Lawn Mowers.

The Granite State Mowing Machine Company, Hinsdale, N. H., has added to its line of lawn mowers for the season of 1906 the two new machines illustrated herewith. The 10-inch wheel four-blade machine shown in Fig. 1 is furnished in both plain and ball bearing styles and, it is remarked, has been carefully tested the past year and given excellent satisfaction. It is explained that some radical changes in gearing and size of cylinder render it an exceedingly easy running mower. The mower illustrated in Fig. 2 has 8-inch wheels and three blades. It is an exceedingly light, but strong and well designed machine, it is stated, with up to date features, and is made of the best material. The special feature of both plain bearing machines is a split swivel bushing for taking up the wearing of the journals. It is pointed out that ordinary bearings bind the cylinder arbor when tightened unless the bearings are absolutely in line, causing them to run hard and wear unequally. The swivel bearing is designed to overcome this difficulty by being always in line with the arbor of the cutter cylinder. These machines are absolutely guaranteed by the manufacturer.

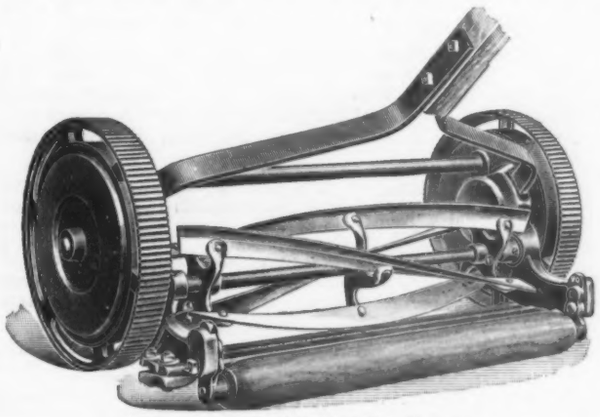


Fig. 1.—Queen Ball Bearing Mower.

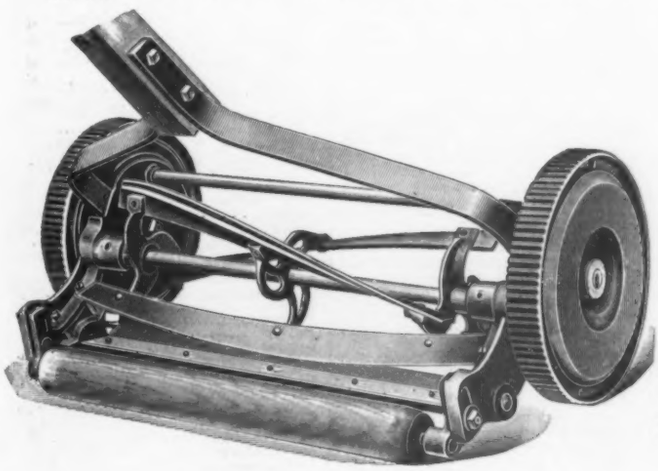
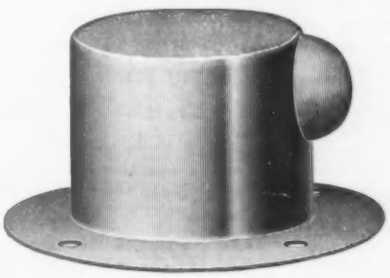


Fig. 2.—The Leader Mower.

The Champion Floor Door Stop.

The Champion Safety Lock Company, Geneva, Ohio, is manufacturing the door stop illustrated herewith, which is made in one piece either of wrought bronze or brass metal. When fastened to the floor with the screws which are packed with it it makes a stop which is practically indestructible, the rubber knob being easily replaced. It is furnished in several different finishes and is packed 1 dozen to the box, 1 gross to the case.



The Champion Floor Door Stop.

Frederick Hoerle, Bridgeport, Conn., has purchased the Hardware and plumbing business which Joseph N. Beard has conducted at Plainville, Conn., for 31 years. Mr. Hoerle expects to greatly expand the business.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔ lb
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry	8¾
Paris, Green Seal, dry	9¾
Antwerp, Red Seal, dry	7½
Antwerp, Green Seal, dry	8¾
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	11¾@12¼
Lots of less than 1 ton	12@12½
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	10½@11
Lots of less than 1 ton	10¾@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls	6 @ 6½
Ocher, American	℔ ton $3.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¾@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	8 @10
Orange Mineral, French	10¾@12¼
Orange Mineral, German	8 @10
Orange Mineral, American	8¼@ 8½
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer	℔ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Tale, French	℔ ton $15.00@30.00
Tale, American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb 90 @1.00
Terra Alba, English	℔ 100 lb 90 @1.00
Terra Alba, American, ℔ 100 lb., No. 1	60 @70
Terra Alba, American, ℔ 100 lb., No. 2	45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	℔ ton $17.50@19.00
Barytes, Amer. floated	℔ ton 18.00@19.00
Barytes, Crude, No. 1	℔ ton 10.00@11.00
Chalk, in bulk	℔ ton 3.00@ 3.25
Chalk, in bbls	℔ 100 lb @ .35
China Clay, English	℔ ton 11.00@17.00
Cobalt, Oxide	℔ 100 lb 2.50@ 2.60
Whiting, Common	℔ 100 lb .43@ .48
Whiting, Gilders	℔ 100 lb .50@ .55
Whiting, Ex. Gilders	℔ 100 lb .55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.75
In bbls. or tubes	1.10 @1.15
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.40 @1.55

Spirits Turpentine—℔ gal.

In Oil bbls	63 @63½
In machine bbls	63½@64

Glue—

	℔ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial	35 @37
Bone Dried	45 @47
Button	36 @45
Diamond I	@55
Fine Orange	45 @47
A. C. Garnet	39 @40
D. C.	35 @..
Octagon B	@52
T. N.	42 @43
V. S. O.	58 @60

Animal, Fish and Vegetable Oils—℔ gal.

Linseed, City, raw	54 @55
Linseed, City, boiled	56 @57
Linseed, State and West'n, raw	52 @53
Linseed, raw Calcutta seed	@62
Lard, Extra Prime, Winter	59 @60
Lard, Extra No. 1	47 @48
Lard, No. 1	35 @39
Cotton-seed, Crude, f.o.b. mills	23 @23½
Cotton-seed, Summer Yellow, Prime	30 @30¼
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	55 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @63
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	28 @29
Menhaden, Light, Strained	29 @30
Menhaden, Bleached, Winter	31 @32
Menhaden, Ex-Bld. Winter	32 @33
Menhaden, Southern	16½@17
Cocoanut, Ceylon	℔ lb 6½@ 6¾
Cocoanut, Cochin	℔ lb 7¼@ 7½
Cod, Domestic, Prime	34 @36
Cod, Newfoundland	39 @41
Red, Elaine	32 @33
Red, Saponified	℔ lb 4½@ 4¾
Olive, Italian, bbls	57 @59
Neatsfoot, prime	49 @50
Palm, Logos	℔ lb 5¾@..

Mineral Oils—

Black, 29 gravity, 25@30 cold test	℔ gal. 10½@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11¼
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12¼@13
Paraffine, 903 gravity	11¼@12
Paraffine, 883 gravity	9¼@ 9½
Paraffine, Red	11¼@13

In small lots ½¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—
See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—
Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers—
See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur.....70&10@75%
Jennings' Patn. reg. finish.50&10%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&2&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $28; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz. $9.00@10.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—
Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—
See *Hafts, Awl.*

Awls—
Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—
See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights:
First Quality.....$6.75
Second Quality.....$6.25
Double Bit, base weights:
First Quality.....$8.75
Second Quality.....$8.25

Axle Grease—
See *Grease, Axle*

Axles—
Iron or Steel
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—
See *Fishing—*

Balances—
See *Sash—*
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—
See *Wire, Barb.*

Bars—
See *Crow—*
Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel -
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—
Blacksmith, Standard List.. 60&10@70&10%

Hand—
Molders—
Net Prices.

	6	7	8	9	10
Inch..					
Doz...	$4.50	5.00	5.50	6.00	6.50

	9	10	11	12	14
Inch..					
Doz...	$8.00	9.00	10.50	12.50	14.50

Bells—
See *Cow—*
Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—
See *Leather—*
Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....60%
Leather Lacing Sides, per sq. ft. 22¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....65&70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—
See *Tackle—*
Common Wooden....70&10@75&5%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread): ⅝ x 6 and Smaller.....75&10% Larger and Longer..... 65&10&2½&10%
Phila. Eagle $3.00 list May 24, '99 80%
Bolt Ends, list Feb. 14, '95.... 70&2½&10%
Machine, ⅝ x 4 and smaller 75&2½&10%
Machine, larger and longer... 70&2½&10%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:

	Inch	3	4	5	6	8
Per doz.	$0.30	.35	.45	.56	.75	

Cast Iron Spring Foot, Jap'd:

	Inch	6	8	10
Per doz.	$1.15	1.40	2.00	

Cast Iron Chain, Flat, Japanned:

	Inch	6	8	10
Per doz.	$0.95	1.25	1.55	

Cast Iron Shutter, Japanned, Brass Knobs:

	Inch	6	8	10
Per doz.	$0.80	.90	1.20	

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—
Plow .....65&10@65&10&10%
Stove .....82½&10@82½&10&5%

Tire—
Common 80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '81....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.....	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—
Common Ball, American. $1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—
Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf.....80&10@85%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—
Price per dozen.

Quart.....	10	12	14
Water, Regular...	1.40	1.70	1.90
Water, Heavy....	3.40	3.70	3.80
Fire, Rd. Bottom..	2.30	2.55	2.95
Well	2.55	2.87	3.15

Bucks, Saw—
Hoosier.....℔ gro. $36.00

Bull Rings—
See *Rings, Bull*

Butts—
See *Brass—*
Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—
Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts.... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Extra, 10&10&5@10&10&10%

Cages, Bird—
Hendryx Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....60&10%

Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong....per lb.4@4½¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....℔ lb 3.65¢
Perkins', Sharp Toe....℔ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	6	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B....52@55¢
G. D....per M 34@35¢
F. L....per M 40@42¢
G. E....per M 58@50¢
Musket....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50....10&5%
38 C. F., $7.00....10&5%
22 cal. Rim, $1.50....10&5%
32 cal. Rim, $2.75....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.49
Central Fire....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting....50%
Rim Fire, Military....15&5%

Casters—

Bed....70@70&10%
Plate....60&10@60&10&5%
Philadelphia....75@75&10%
Acme, Ball Bearing....33⅓%
Boss....70&10%
Boss Anti-Friction....70&10%
Gem (Roller Bearing)....80%
Martin's Patent (Phoenix)....45%
Standard Ball Bearing....45%
Tucker's Patent low list....30%
Yale (Double Wheel) low list....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$7.95	5.40	4.50	3.85	3.70	3.60	3.55

⅝ ¾ ⅞ to 1 1⅛ to 1¼ inch.
$3.50 3.40 3.35 3.45 per 100 lb.
German Coil....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97....60&10&10%
Cow Ties....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring..$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron....60&10@60&10&5%
Brass....60&10@60&10&10%
Safety Chain....75@75&10&5%
Gal. Pump Chain....lb. 5@5¼%
Covert Mfg. Co.:
Breast....35&5%
Halter....35&5%
Heel....35&5%
Rein....35&5%
Stallion....35&5%
Covert Sad. Works:
Breast....70%
Halter....70%
Hold Back....70%
Rein....70%
Oneida Community:
Am. Coil and Halters....40@40&5%
Am. Cow Ties....45@50%
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties....45&5@50&10&5%
Niagara Dog Leads and Kennel Chains....45@50&5%
Wire Goods Co.:
Dog Chain....70&10%
Universal Dbl.-Jointed Chain....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain....60&5%
Steel Chain....60%
Pullman:
Bronze Chain....60%
Steel Chain....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro. 35@38¢
Carpenters' Red....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's....45%
Eclipse....60&10%
Pullman, per gro....$54.00
Russwin....40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools....55%
Youths' Chests, with Tools....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools....20%
Machinists' and Pipe Fitters' Chests, Empty....50%
Tool Cabinets....50%
C. E. Jennings & Co.'s Machinists' Tool Chests....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List....75@75&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Socket Firmer No. 10....60%
C. E. Jennings & Co. Socket Framing No. 15....60%
Ohio Tool Co.'s....70%
Swan's....75%
L. & I. J. White....30@30&5%

Tanged—

Tanged Firmers..33 1-3@33 1-3&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Nos. 191, 131...25%
L. & I. J. White, Tanged....25&5%

Cold—lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—

Beach Pat., each $8.00....35&5%
Empire....25%
Blacksmiths'....25%
Jacobs' Drill Chucks....35%
Pratt's Positive Drive....25%
Skinner Patent Chucks:
Independent Lathe Chucks....50%
Universal....50%
Combination....50%
Drill Chucks, New Model....30%
Drill Chucks, Standard....45%
Drill Chuck, Skinner Pat., all sizes..35%
Drill Chucks, Positive Drive....30%
Planer Chucks....25%
Face Plate Jaws....40%
Standard Tool Co.:
Improved Drill Chuck....45%
Union Mfg. Co.:
Combination....50%
Czar Drill....35%
Combination Geared Scroll....40%
Geared Scroll....40%
Independent....50%
Independent Steel....40%
Union Drill....45%
Universal....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks....50%
Little Giant Auxiliary Drill....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill....50%
Scroll Combination Lathe....50%

Clamps—

Adjustable, Hammers'....20@20&5%
Cabinet, Sargent's....50&10%
Carriage Makers', P., S. & W. Co....40&10@50%
Carriage Makers', Sargent's....60%
Besly Parallel....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co....40%
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers'....40&10%

Cleaners, Drain—

Iwan's Champion, Adjustable....55%
Iwan's Champion, Stationary....45%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7⅛ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros....30%
New Haven Edge Tool Co.'s....45%
Fayette R. Plumb....33⅓@33⅓&10%
L. & I. J. White....30%

Clippers—

Chicago Flexible Shaft Company:
'96 Chicago Horse....$8.75 } 15%
1902 Chicago Horse....10.75 }
20th Century Horse, each, $5.00....20%
Lightning Belt....$15.00 }
Chicago Belt....$20.00 } 15%
Stewart's Patent Sheep, $12.75....20%

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks....70&10@75%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list....40%
Leather, Walter B. Stevens & Son's list....40%

Combs, Curry—

Metal Stamping Co....40%

Mane and Tail—

Covert's Saddlery Works....60&10%

Compasses, Dividers, &c.

Ordinary Goods....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers....65%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50%

Conductor Pipe,—

L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	*....70&15%*	*70&10%*
Central	*....70@71½%*	*70@21½%*
Southern	*....70@21½%*	*60@20%*
So. Western	*..60@20%*	*60@10%*
Copper.		*11¢16 oz.*
Eastern		*....50@10%*
Central		*....50@71½%*
Southern		*....50@5%*
So. Western		*....50@21½%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	5	6	8
Iceland, ea.	$1.80	$2.10	$2.40		$3.00
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled....25%
Agate Lined....25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2....22@23¢

Cord—Sash—

Braided, Drab....lb. 35¢
Braided, White, Com., Nos. 6 to 12....lb. 23@24½¢
Cable Laid Italian....lb., A, 18¢; B, 16¢
Common India....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia....lb..@14¢
Cable Laid Russia....lb..@15¢
India Hemp, Braided..lb..@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: Braided Cotton, Old Glory, Nos. 7 to 12....℔ lb 29¢
Anniston, Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢; Anniston Drab, Nos. 7 to 12, ℔ lb, 26¢; Anniston Mahogany, 27¢.
Pearl Braided, cotton, No. 6, ℔ lb, 24½¢; No. 7, 23½¢; Nos. 8 to 12, 23¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10....℔ lb 23 ¢
Peerless:
Cable Laid Italian....16 ¢
Cable Laid Russian....14 ¢
Cable Laid India....12 ¢
Braided India....18 ¢
Pullman:
Wire Sash Cord....10¢
Sash Cord Attachments, per doz..10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton....℔ lb 40 ¢
Braided, Italian Hamp....℔ lb 40 ¢
Braided, Linen....℔ lb 55 ¢
Braided, White Cotton or Spot....
Massachusetts, White....℔ lb 28 ¢
Massachusetts, Drab....℔ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab....40 ¢
A quality, White....35 ¢
B quality, Drab....35 ¢
B quality, White....30 ¢
Italian Hemp....40 ¢
Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00....85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square....gr. $1.50
Rolling Mill Crayons....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots, 20%
Zelnicker's Lumber:
Red, Blue, Green....℔ gro. $6.50
Black....℔ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy....℔ doz. $7.00
Fort Madison, Light....℔ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor....℔ doz. $3.00
Wm. Rogers & Son....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co....40%
Red Devil....50%
Smith & Hemenway Co....50%
Woodward....40%

Meat and Food—

American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's....℔ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal....40&10@50%
Little Giant....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers....25%
New Triumph No. 605, ℔ doz. $24.00....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00....45&10&10%
Woodruff's....℔ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18....40%
Sargent's, ℔ doz., No. 2....60%
Sargent's, Nos. 12 and 21....60&10%

Washer—

Appleton's, ℔ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers....℔ doz. $6.25
Iwan's Perfection Post Hole Digger, ℔ doz. $8.25
Iwan's Split Handle Post Hole Diggers....℔ doz. $7.25
Kohler's Universal....℔ doz. $14.00
Kohler's Little Giant....℔ doz. $12.00
Kohler's Hercules....℔ doz. $10.00
Kohler's Invincible....℔ doz. $9.00
Kohler's Rival....℔ doz. $8.00
Kohler's Pioneer....℔ doz. $7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00....60%
Samson, ℔ doz. $34.00....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....℔ doz. $10.00
Phillips', style 077, ⅞ in....℔ doz. $7.50
Phillips', style x-y, ⅞ in....℔ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel-Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each....$1.50@$1.75
Breast, Millers Falls....15&10%
Breast, P., S. & W....40%
Goodell Automatic Drills..40&5@10&10%
Johnson's Automatic Drills, Nos. 2 and 3....16⅔%
Johnson's Drill Points....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis....25%
Ratchet, Parker's....40%
Ratchet, Weston's....70%
Ratchet, Weston's, Style H Improved....40%
Ratchet, No. 012....40%
Ratchet, Whitney's, P., S. & W....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00....33⅓%

Twist Drills—

Bit Stock....60&10&10@70%
Taper and Straight Shank....60&10@60&10&5%

Drivers, Screw—

Screw Driver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9....50%
Buck Bros.' Screw Driver Bits....30%
Champion....50%
Edson....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood....40%
Mayhew's Black Handle....40%
Mayhew's Monarch....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co....50&10%
Sargent & Co.'s:
Nos. 1 and 60....50&10&10%
Nos. 50, 53 and 55....60&10%
Nos. 20 and 40....70&10%
Smith & Hemenway Co....40&5%
H. D. Smith & Co.'s Perfect H'dle..40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles....65%
No. 86....75%
Victor....55%
Defiance....70%
Swan's:
Nos. 7565 to 7568....50%
No. 7540....10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*....80&5%*
Central	*....75&10&10%*
Southern	*....75&12½%*
So. Western	*....75&5%*

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge....60&10%
No. 26....35%
No. 24....25%
No. 22....10%
Copper....37½%
Perfect Elbows (S., S. & Co.)....40%

Emery, Turkish—

	4 to 6	*5 to 180*	*Flour*
Kegs....lb.	*5 ¢*	*5½¢*	*3½¢*
½ Kegs....lb.	*5½¢*	*5¾¢*	*3¾¢*
¼ Kegs....lb.	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%

Cord and Weight—
Ives 40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined..
60&10@70%
Red Cedar.....40&10@50%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..
50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined....50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 2½, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's 70%
Stowell's Giant Grindstone Hanger..
℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures, Light.
60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
10@2½%

Gates, Molasses and Oil—
Stebbins' Pattern .80&10@80&10&5%

Gauges—
Marking, Mortise, &c.....
50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $3.00; 2, $3.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $3.30; 2, $3.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..
25@50%
Cans (½ pts., pts., qts., ½ gal., gal.) .....25@48%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@5.50
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil.....25%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each .....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.00

Halters and Ties—
Covert Mfg. Co.:
Web .....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Work::
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25 $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....
33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....
50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....
40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢.....
80&10&10@85%
3 to 5 lb., per lb. 40¢.....
80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion .....45@45&10%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@$2.85
Brad Awl.....gro. $1.65@$1.85
Chisel Handles:
Apple Tanged Firmer, gro. assorted .....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted .....$2.15@$2.40
Apple Socket Firmer, gro. assorted .....$1.75@$1.95
Hickory Socket Firmer, gro. assorted .....$1.45@$1.60
Hickory Socket Framing, gro. assorted .....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, Axe, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80@85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle....
℔ gro. $0.85@$1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered .....60&2%
Special .....70&5%
Lawrence Bros.:
Advance .....60&10%
Cleveland 75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
Peerless 75%
Sterling .....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8..:...$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings Nos. 39, 41, 46 .....75%
Anti-friction No. 42.....60&20%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator 40%
Express 50%
Freight Car Door.....60%
Interstate .....60&10%
Lundy Parlor Door.....50&10%
Magic 60%
Matchless .....60&10%
Nansen .....70&5%
Parlor Door.....50&10%
Railroad .....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle 70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot 60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing..℔ doz. $5.00
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives Wood Track.....60&10%
L. T. Roller Bearing....60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet 50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....50%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled.. $27.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Extra 5&10% often given.

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair.	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair.	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair.	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....
75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'f'es.	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.40*	*2.05*	*3.80*
Latches only.....	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback Cast Iron.....
gro. $9.00@$9.50
Non-Holdback, Cast Iron.....
gro. $8.00@$8.50

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....15%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges.....40%
No. 990 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge .....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Hold'k.℔ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap..75&5%
Cor. Ex. Heavy T.70&10%
Extra 10@10&5%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods—

Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—

Avery-Caldwell Mfg. Co.:
Steel Brick.....each $1.00
Steel Mortar.....each $1.25
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes—

Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&10%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'ting Shuffle Hoe, ℔ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders—

Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Atlas, Coat and Hat.....75&10%
Bradley Metal Clasp Coat and Hat.....75&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $1.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons—

Sad—

From 4 to 10.....lb. 3¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing.lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz. $2.65;
Dent, $2.75; Adj. Serrated, $2.20;
Serrated, $2.10; Yankee No. 1, $1.50;
Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz. $5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro. $1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches—

Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101.
℔ doz. $2.90
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.70*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks—

Cabinet—

Cabinet Locks...33⅓&33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron....75&10&5@80&5%
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—

Reisinger Invincible Hand Power.....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cinti Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Apple-wood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list..
50&10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Queen, 14 in., $3.20; 16 in., $3.60; 18 in., $4.00; 20 in., $4.40.
Queen Ball Bearing, 14 in., $3.60; 16 in., $4.00; 18 in., $4.40; 20 in., $4.80.
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list..50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	...50%
Coleman	18	17	16	15	14	...net
New Haven	25	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	...33⅓%
New Putnam	19	18	17	16	16	..10&10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*..gro*
Por. Head...	*1.10*	*1.10*	*1.10*		*..gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank.....$5.00
Hexagon, Blank.....$5.50
Square, Blank, C. T. & R..$5.20
Hexagon, Blank, C. T. & R. 5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.50
Hexagon, Blank.....$5.90
Square, Tapped.....$5.40
Hexagon, Tapped.....$5.80

Oakum—

Best or Government.....lb. 6¢
U. S. Navy.....lb. 5¾¢
Navy.....lb. 4¾¢
Plumbers' Spun Oakum.....4¼¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10&10%
Zinc.....65&10&10%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—

Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb. 1½@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans—

Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

	1	*2*	*3*	*4*	*5*
Nos.					
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

	12	*14*	*16*	*18*
Inch				
Per doz.	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co. ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: *lb.*
lb.....6¢
Building Felt, 8, 10 and 12 Mill Board, sheet, 40x40 in., 1-32 to ½ in.....10¢
Roll Board, 1-16 in. and under.....6¢
Roll Board, 3-32 and ⅛ in. 8¢
33 1-3%
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll 35¢@40¢
Medium weight, 30 lbs. to roll, 40@45¢
Heavy weight, 40 lbs. to roll.. 56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton.... $32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth 25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance	℔ doz.	$4.00
Baldwin	℔ doz.	$4.00
Bonanza Improved	each	$6.50
Daisy	℔ doz.	$4.00
Dandy	each	$7.50
Eureka Improved	each	$20.00
Family Bay State	℔ doz.	$15.00
Improved Bay State	℔ doz.	$36.00
Little Star	℔ doz.	$5.00
New Lightning	℔ doz.	$7.00
Reading 72	℔ doz.	$3.25
Reading 78	℔ doz.	$6.25
Rocking Table	℔ doz.	$6.20
Turn Table '98	℔ doz.	$6.00
White Mountain	℔ doz.	$5.00

Potato—

Saratoga	℔ doz.	$7.00
White Mountain	℔ doz.	$6.00

Picks and Mattocks—

List Feb 23, 1899 ..... 75@75&5%
Cronk's Handled Garden Mattock, ℔ doz., $6.40 ..... 33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ..... 60@60&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in 60%
Extra Heavy, 2-5 in 70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		Iron.	
	Blk.	Galv.	Blk.	Galv.
1/8 & 1/4 in.	67%	51%	65	49
3/8 & 1/2 in.	71%	59%	69	57
3/4 to 6 in.	75%	65%	73½	63½
7 to 12 in.	70%	55%	68½	53

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England 68%
New York and New Jersey .. 71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va. ... 71%
Virginia 76%
Ohio, Michigan and Ky. 77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual. ..... 40&10%
Bench, second qual. ..... 50&10%
Molding ..... 33⅓&10%
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60%
Sargent's ..... 60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 25&10@30%
Buck Bros. 30%
Chapin-Stephens Co. ..... 30@30&10%
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... ℔ doz. $8.50

Plates—

Felloe ..... lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.). ℔ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 75&10@80%
Gas Burner, per doz.: 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 60%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor. 40@40&10&10%
Pocket Levels ..... 30@30&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels 70%
C. E. Jennings & Co.'s Iron 33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co. 45%
Stanley's Plumbs 35%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00 ..... 50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers ..... *lb.* 9 @9½¢
¼-lb. papers ..... *lb.* 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye ..... ℔ doz. $3.25
Ft. Madison Western ..... ℔ doz. $4.00

Police Goods—

Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $6.75 ..... 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ℔ doz. $1.00
Black Silk, 5 oz. box ..... ℔ doz. $0.75
Black Silk, ½ pt. liq ..... ℔ doz. $1.00

Poppers, Corn—

1 qt., Square ..... *gro.* $9.00
1 qt., Round ..... *gro.* $10.00
1½ qt., Square ..... *gro.* $11.00
2 qt., Square ..... *gro.* $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb ..... *each* 45¢
Fine Sporting, 1 lb .... *each* 75¢
Rifle, ½-lb ..... *each* 15¢
Rifle, 1-lb ..... *each* 25¢
In Kegs:
12½-lb. kegs $3.50
25-lb. kegs $4.50
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk) .. 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun.. 50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller $21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
Pelican, ℔ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots.. ℔ doz. $6.00
Diamond B, No. 3, case lots.. ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $14.50; No. 3, $15 ..... 33⅓%
Staple Pullers 60%
Parrot Tack and Stub Puller, ℔ doz., 75c.: ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20

Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction.. 60&10%
Dumb Waiter, Anti-Friction.. 60&10%
Electric Light 60%
Side, Anti-Friction ..... 60&13%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. ..... 16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. 16@19¢
Acme ..... 1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless.. 50%
Ideal ..... 70&10%
Niagara ..... 1¾ in. 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern ..... 60@60&10%
Pitcher Spout ..... 80@80&10%
Wood Pumps, Tubing, &c. 45@50%
Barnes Dbl. Acting (low list) 50%
Barnes' Pitcher Spout ..... 75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list) 55%
Flint & Walling's Fast Mail (low list) ..... 55&5%
Flint & Walling's Tight Top Pitcher. 80%
National Specialty Mfg. Co., Measuring, $6.00 ..... 30%
Mechanical Sprayer $6.00
Myers' Pumps (low list) 50%
Myers' Power Pumps 50%
Myers' Spray Pumps ..... 50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good ..... *doz.* 50@75¢
Spring, single tube, good quality ..... $1.75@2.00
Revolving (4 tubes) ..... *doz.* $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive. 50%
Bemis & Call Co.'s Check 55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Steel Screw, B. & K. Mfg. Co. 50%
Tinners' Hollow, P., S. & W. Co. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	$3.00	$4.40	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	$2.70	$3.60	*100 feet.*

Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail ..... 2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T. ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ .. 50%
None Better ..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4 ¢
Myers' Stayon Track ..... 60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail.. 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
Safety Door Hanger Co.'s Storm King Safety 60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail ..... ℔ ft. 1¾¢
Steel Rail, Plain 25%
Wrought Bracket, 1 3-16 in.... ℔ ft. 3¢
Wrought Bracket, 1¼ x 5-16.. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢ 60%
P. L. K. Steel Rail ..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16 ..... ℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn.. $2.25
Fort Madison Blue Head Lawn.. $2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.. 75%
Victor Garden, ℔ doz., 12 teeth, $15,00; 14, $16.50; 16, $18.00 ..... 80%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60 ..... net.
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Kohler's:
Lawn Queen, 20-tooth ..... ℔ doz. $3.45
Lawn Queen, 24-tooth ..... ℔ doz. $3.60
Paragon, 20-tooth ..... ℔ doz. $2.75
Paragon, 24-tooth ..... ℔ doz. $3.00
Steel Garden, 14-tooth .... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden ..... 75&5%

Rasps, Horse—

Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
McCaffrey's American St'd.. 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—

Boras—I C. 60%
Fox Razors, No. 42.. ℔ doz. $20.00 } 40% Dis.
Fox Razors, No. 44.. ℔ doz. $30.00 } 40% Dis.
Fox Razors, No. 82, Platina... ℔ doz. $25.00 } 40% Dis.
Red Devil 50%
A. H. Sage Co.:
Arbo Anti-Rust ..... ℔ doz. $10.00
Herbrand ..... ℔ doz. $6.00
Barber ..... ℔ doz. $6.00
Silberstein:
Carbo Magnetic $18.00
Griffon, No. 65 ..... $15.00
Griffon, No. 00 ..... $12.00
All other Razors 40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P 33⅓%
2904 PN 33⅓%
0924 N 33⅓%
02084 N 33⅓%
002904 PN 33⅓%
802 N 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed ..... 70&10%
Bronzed 75%

Revolvers—

Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber $2.00
Automatic $3.45
Hammerless $4.00
Thayer, Robertson & Cary, Hammerless ..... each $3.25
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in. ..... *per doz.* $2.25@$2.50
17 in. ..... *per doz.* $2.50@$2.75
18 in. ..... *per doz.* $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 inch.*
Steel	$0.70	0.75	0.80 *doz.*
Copper	$1.00	1.15	1.40 *doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2¼ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes $4.00@$4.50
Hill's Ringers, Gray Iron ..... *doz.* 50@55¢
Hill's Ringers, Malleable Iron .. *doz.* 70@75¢
Blair's Rings...per gro. $4.75@5.25
Blair's Ringers..per doz. $0.60@ .65
Brown's Rings..per gro. $5.00@5.50
Brown's Ringers.per doz. $0.60@ .65

Rivets and Burrs—

Copper ..... 50&10@60%
Iron or Steel ..... 75@75&5%

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list 60%
Cronk's Stay No. 65, $0.90; No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56 ..... $0.84
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53 .75¢
O. K. Adj. and Reversible No. 5 .. 5.50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%
Stowell's Barn Door Stay.. ℔ doz. $1.00
Swett's Anti-Friction 50%
Screw and Spike Stay ..... ℔ doz. 65¢
Hinge Adjustable Stay ..... ℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure ..... *lb.* 11½@12¢
Sisal, 7-16 in. diam. and larger:
Mixed ..... *lb.* 8@8¼¢
Pure ..... *lb.* 9¼@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed ..... *lb.* 8@8¼¢
Pure ..... *lb.* 9¼@9¾¢
Sisal, Tarred, Medium Lath Yarn:
Mixed ..... *lb.* 7½¢
Pure ..... *lb.* 8½¢
Cotton Rope, on reels: *Lb.*
Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16¼¢
Common, ¼-in. and larger.. 10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6¼¢

*Thread No. 2, ¼-in. & up, lb.*35¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—
Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple ..... 30&10%

Rules—
Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60
Cross Cuts ..... 35&5
Mulay, Mill and Drag 50
One-Man Saw 40
Wood Saws 40
Hand, Compass, &c. 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... *doz. $5.50*
Two Platforms, ½ oz. to 8 lbs. ..... *doz. $16.00*
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ....25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) 50%
Wagon or Stock (reduced list) .25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon .50%

Scrapers—
Box, 1 Handle ..... *doz. $2.00@2.25*
Box, 2 Handle ..... *doz. $2.60@2.85*
Ship ... Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens ..60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames ..60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼ .$3.50@3.75
Bench, W'd, Beech .doz. 30@30&5%
Hand, Wood ..... *30@30&5%*
R. Bliss Mfg. Co., Hand ..30@30&10%
Chapin-Stephens Co., Hand ..30@30&10%
Ohio Tool Co., Bench and Hand ..30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... *75&17½&10%*
Coach, Gimlet Point, list Oct. 1, '99 ..... *75&12½&10%*
Hand Rail, list Jan. 1, '81 .... *70&10@75%*

Jack Screws—
Standard List ..... *75&10@80&5%*
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W. 50%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron .... *50@50&10%*
Flat or Round Head, Brass .... *50@50&10%*

Set and Cap—
Set (Iron) *80%*
Set (Steel), net advance over Iron *25%*
Sq. Hd. Cap *75%*
Hex. Hd. Cap *75%*
Rd. Hd. Cap ..... *60&10%*
Fillister Hd. Cap ..... *60&10&10%*

Wood—
List July 23, 1903.
Flat Head, Iron ..... *87½&10@..%*
Round Head, Iron ... *85 &10@..%*
Flat Head, Brass .... *85 &10@..%*
Round Head, Brass .. *80 &10@..%*
Flat Head, Bronze ... *77½&10@..%*
Round Head, Bronze .75 &10@..%
Drive Screws ..... *87½&10%*

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Prices announced for next season:
Clipper Pattern, Grass *$6.20*
Full Polished, Clipper *$6.75*
Grain *$8.00*
Clipper, Grain *$8.25*
Weed and Bush *$6.25*

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00 ..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... *gro. $3.50@3.75*
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Cor'gated, Cup Pt. ... ℔ gro. $7.20
Snell's Knurled, Cup Pt. ... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... *75@75&10%*

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.00 ..... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.60 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 20 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co. 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} 40%

Skate—
Smith & Hemenway Co. 20%

Shaves, Spoke—
Iron ..... *doz.$1.10@1.25*
Wood ..... *doz.$1.75@2.25*
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.) 35%
Chapin-Stephens Co. ..... 30@30&10&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—
Cast Iron..	*7*	*8*	*9 in.*	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... *70@70&10%*
Best quality, Nickel .. *60@60&10%*
Fair quality, Jap .... *80@80&5%*
Fail quality, Nickel .. *75@75&10%*
Tailors' Shears ..... *40@40&10%*
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list ..... 50&10%

Tinners' Snips—
Steel Blades ..... *20&5@20&10%*
Steel Laid Blades ..... *40&10@50%*
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ..... 50&10%
P., S. & W. Co. 33⅓%
Wilkinson's Hedge, 1900 list ..... 50&10%
Wilkinson's Lawn and Border 50%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge .25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20&5%
Expert, Metal Lined and Pigeon, 10 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder .. *40%*
Loaded with Smokeless Powder, medium grade ..... *40&5%*
Loaded with Smokeless Powder, high grade ..... *40&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg *$4.00*
Steel ..... per keg *$3.75*
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag *$1.70*
Drop, B and larger ..... *per 25-lb. bag, $1.95*
Buck, 25-lb. bag *$1.95*
Chilled, 25-lb. bag *$1.95*

Shovels and Spades—
Association List, Nov. 15, 1902 .40%

Sieves and Sifters—
Hunter's Imitation ..... *gro. $10.50@11.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S. Co., ℔ gr.:
14&16 ..... 16&18 ..... 18&20
$13.20 ..... $13.50 ..... $14.40
Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00 ..... 20%

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*1¼*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... *doz. $0.90@0.95*
Mesh 20, Nested .... *doz. $1.00@1.05*
Mesh 24, Nested .... *doz. $1.30@1.40*

Sinks, Cast Iron—
Standard list ..... *60@60&10%*
Barnes' low list ..... 60&5%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... *80&10@80&10&10%*
Steel ..... *40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates ..... *50@50&10%*
Eureka, Unexcelled Noiseless .. *60&5 tens*
Victor A, Noiseless ..... *60&¼ tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... *40@40&10%*
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 45%
Jockey 35%
Trojan 45%
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch ..... 60&5%
Swivel Snaps 60%
Swivels 50%
Sargent's Patent Guarded ....66⅔&10%

Snaths—
Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... *50&10@60&5%*
Cheap ..... *60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... *60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... *per gro. 45@50¢*
Tables ..... *per gro. $0.50@$1.00*

Springs— Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—
1¼ in. and Wider: *Per lb.*
Black ..... *4@4¼¢*
Half Bright ..... *4@4¼¢*
Bright ..... *4½@4¾¢*
Painted Seat Springs:
1½ x 2 x 26 ..... *per pr. 42¢*
1½ x 3 x 28 ..... *per pr. 70¢*

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—
Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron . } *75&5@75&10%*
Rosewood Hdl. Try Square and T-Bevels ..... *60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels ..... *40&10@40&10&10%*
Disston's Try Sq. and T-Bevels 70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ... doz. $1.75

Staples—
Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list .. *80&10&10&10%*
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples ..... *per lb. 3¼@3½¢*
Grand Crossing Tack Co.'s list .80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 40%

Steelyards— .... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... *50@50&10%*
Curtis Rev'ble Ratchet Die Stock .. 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit .60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 80¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
} 33⅓%
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 33⅓%

Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar.₱ lb 8¢
Hindostan No. 1, Small..₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more..₱ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.00
Green Mountain S. S..₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Corundum.....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket.....doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz,
Louis XV, Roller Bearing, Gold Plated.....$120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled.....$25.00
Triple Medal, Roller Bearing, Nickeled.....$24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled.....$24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in, case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in, case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in, case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled.....₱ doz. $23.00
Model B, Sterling, Japanned.....₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90&37½&2½%
American Cut Tacks....90&37½&2½%
Swedes Cut Tacks.....90&37½&2½%
Swedes Upholsterers' Tacks.....90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&37½&2½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks.....90&6 or 7 cns
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also Nails, Wire.

Tanks, Oil— Each.

Emerald, S., S. & Co.....30-gal. $3.40
Emerald, S., S. & Co.....60-gal. $4.25
Queen City, S., S. & Co....30-gal. $3.65
Queen City, S., S. & Co....60-gal. $4.50

Tapes, Measuring—

American Asses' Skin..50@50&10%
Patent Leather.....25@30&5%
Steel.....40@40&10%
Chesterman's.....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather.....25&5@25&10%
Metallic and Steel, lower list.....35@35&5%
Pocket.....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic.....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket.....40@40&5%
Steel.....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern..75&10@75&10&5%
Newhouse.....40@45&5%
Hawley & Norton.....65%
Victor.....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.25
No. 3, Rat, ₱ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ₱ gro. $4.70 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery.....₱ doz. $15.00
Daisy Stove Trucks, Improved Pattern.....₱ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

No. 1 2 3
Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (S., S. & Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine: BC. B.
No. 9, ¼ and ½-lb. Balls..22@24¢
No. 12, ¼ and ½-lb. Balls..18@20¢
No. 18, ¼ and ½-lb. Balls..16@18¢
No. 24, ¼ and ½-lb. Balls..16@18¢
No. 36, ¼ and ½-lb. Balls..15@17¢
Chalk Line, Cotton ½-lb. Balls.....25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...11½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls.....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8½¢
India 3-Ply Hemp, 1-lb. Balls..8½¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls.....9@10¢
Mason Line, Linen, ½-lb. Bls.46¢
No. 26½ Mattress, ¼ and ½-lb. Balls.....57¢
Wool, 3 to 6 ply....B 5½¢; A 6¢

Vises—

Solid Box.....60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists'.....40@40&5%
Keystone.....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch.....50%
Solid Jaw.....50%
Merrill's.....30%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher.....40%
Perfect.....20%
Lightning Grip.....30%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Snediker's X. L.....33⅓%
Stephens'.....33⅓%
Williamson Mfg Co, Double Swivel..40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Perfection Saw Clamps, ₱ doz....$4.50
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Williamson Mfg. Co. Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25
} *Dis. 15%*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled.....55%
Ground.....60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs.....$2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled.....50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:
Inch..... 6 7 8 9
Each.....45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained.....50&5&50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector.....$3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated.....$2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back.....$3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface.....$3.25
Glass Surface:
Glass King, Single Surface, open back.....$3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid.....80&10@80&10&10%
Patent.....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$5.20 4.30 3.00 2.80 2.60

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4.....50&10%

Wedges—

Oil Finish.....lb 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District.....$25.00
Southern Territory.$19.00@20.00
Western and Central Districts.....$18.50@25.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.65@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&7½%
10 to 18.....80@80&5%
19 to 26.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....30%
Copper, list Feb. 26, '96.....10%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903..90&30@90&40%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½ ¢
No. 6 Mesh, sq. ft.....3½ ¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme.....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50%
Boardman's.....40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"....40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....30%
Hercules.....70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Improved Pipe (W. & B.).....60%
Solid Handles, P., S. & W...50&10@60
Stillson.....65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.75@8.00

For the Table of "Current Metal Prices" see the First Issue of Every Month.